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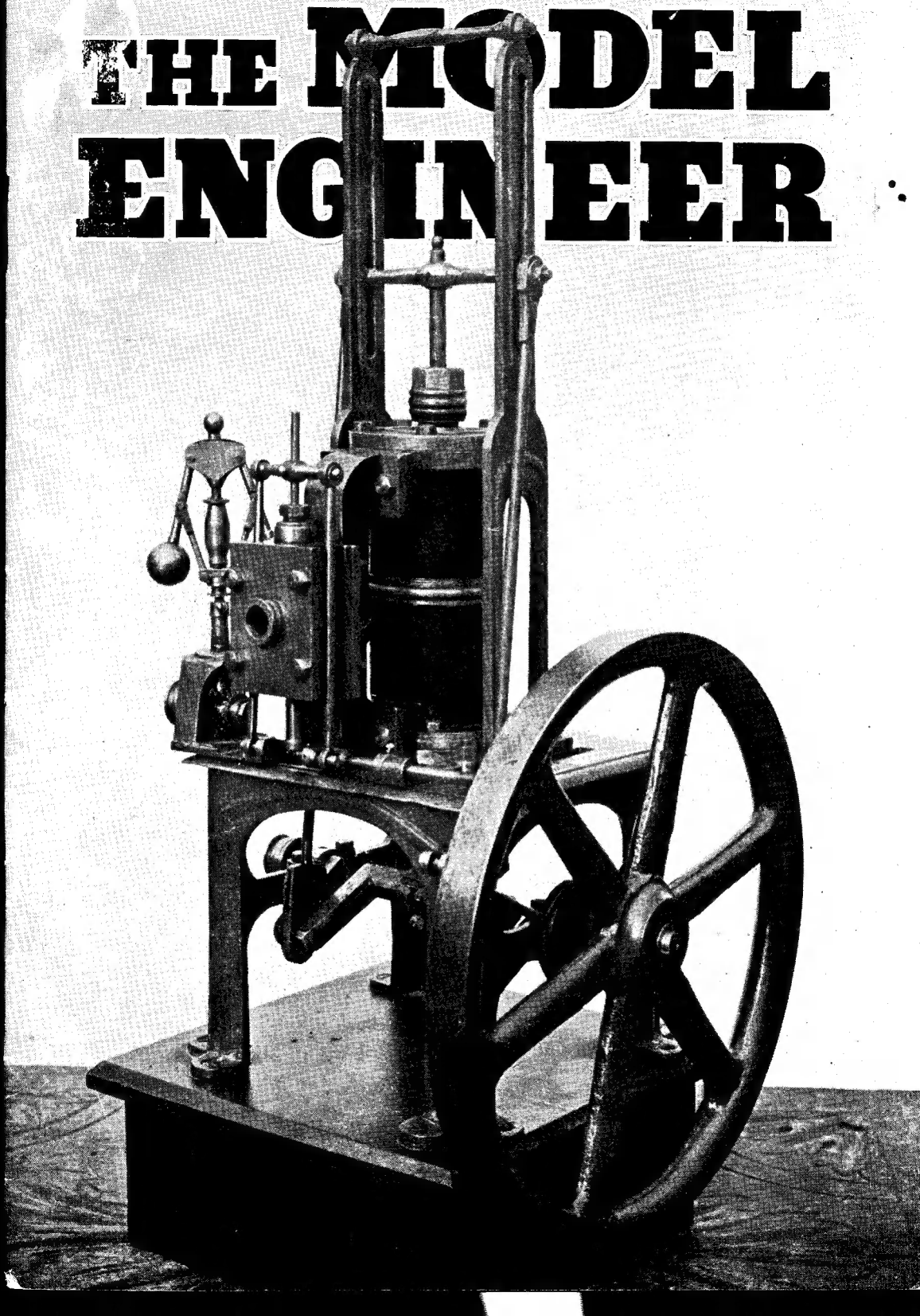
THE MODEL ENGINEER



The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

16TH AUGUST 1951 VOL. 105 NO. 2621

SMOKE RINGS

Our Cover Picture

● THE ENGINE shown in this photograph is a genuine antique, and is believed to be an authentic model of the original Maudslay table engine. It has recently been presented to the Sutton Model Engineering Club by Mr. E. A. Tratt, who obtained it from an old friend, now deceased, in whose family it had been for over 70 years. Although nothing is definitely known of the original constructor of the model, there is good reason to believe that he was one of the engineers who took part in the construction of the prototype engine. The model will be on view on the stand of the Sutton Model Engineering Club at the "M.E." Exhibition, which opens next Wednesday.

"Duplex" at the "M.E." Exhibition

● ONE OF the most unyielding problems which faces us continually in these difficult days is finding space for good things. The problem dominates the production of our periodicals and even extends its unwelcome presence to the arrangements for the "M.E." Exhibition! Last year, the popular pair of contributors who write under the name of "Duplex" had a large stand on which to demonstrate a wide selection of tools and appliances they had designed and made; this year, space requirements at the New Horticultural Hall have been so pressing that "Duplex" have not got so large a stand. Nevertheless, the selection of tools on show covers past, present and future "In the Workshop" articles, and includes the hacksaw machine which aroused so much interest last year, together with a small sand-blasting appliance as well as a very interesting twist-drill grinding machine which has not yet been described. Visitors should not miss this stand if they are looking for useful ideas in workshop equipment.

Malden Gala Day

● ON SUNDAY, August 26th, the Malden and District Society of Model Engineers will be holding a gala day at the society's track, Claygate Lane, Thames Ditton. Readers who may be in London for the "M.E." Exhibition and would like to take the opportunity of meeting other enthusiasts and of seeing live steam locomotives at work will be welcome.

This idea was first tried out last year and proved to be so successful that it is being repeated. The date is the Sunday after the opening of the "M.E." Exhibition. Refreshments will be available and, above all, a very warm welcome awaits visitors.

That Double-ender

● THE PHOTOGRAPH reproduced on page 622 of our May 17th issue has brought in a very large number of letters from readers who recognise the engine as a Darby Patent Broadside Digger, and suggest that the name which we printed as "Plesbey" should be "Pleshey." This machine was invented by Mr. T. C. Darby, a tenant-farmer, of Pleshey Lodge, Chelmsford, and the first three seem to have been built about 1880 by W. & S. Eddington, of Wickford. Later, such firms as Savage, McLaren and Burrell built some examples under licence.

We do not seem to have succeeded yet in tracing the owner of the original photograph. We had thought that there might have been some possibility that the photograph was taken somewhere in the Abingdon area; Mr. Turney found it in the road not far from Didcot. Our idea, however, seems to be discountenanced by the note, "Pleshey, May 31st, 1891" on the back, which could quite well indicate where it *was* taken.

We are, of course, very grateful to all the many readers who have sent in information on this matter, and especially to those who have gone to the trouble to send us further illustrations. If space permits, we will endeavour to publish some of this material.

The G.W.R. "Bulldogs"

● TO READERS who have studied the development of locomotive practice on the Great Western Railway during the past fifty years, what is now the Western Region of British Railways will seem strange without any of those one-time popular favourites, the "Bulldogs." At the moment of writing, only one, No. 3454, *Skylark*, remains at work, whereas this class of sturdy, powerful and speedy 4-4-0 locomotives originally consisted of no fewer than 156. One, No. 3453, *Seagull*, is in store at Swindon, but has done no work for some time; all the others have been withdrawn for scrap, the process taking place, more or less gradually, during the last twenty years or so.

The class originated in 1899, being an enlarged development of the double-framed, 5 ft. 8 in. 4-4-0 "Duke" class, designed for working fast passenger and freight traffic over the very heavy gradients in the Exeter, Plymouth and Penzance areas. The engines proved to be so successful that, in due course, they were fairly evenly distributed all over the G.W.R. system.

Just recently, considerable attention has been focussed on the class because of an excursion organised by the Stephenson Locomotive Society and the Birmingham Locomotive Club from Birmingham to Swindon and back, one of the features of which was that the special train should be hauled by a "Bulldog," if one was available. *Skylark* was the only one in service, and since she was considered to be in sufficiently good condition to work the train, she was duly sent from Reading, her home shed, to Tyseley to be prepared for the trip.

During the previous afternoon and evening, a team of about twenty members of the S.L.S. and B.L.C. volunteered to remove as much as possible of the grime which covered the engine, and they made a very good job in their capacity as temporary cleaners.

The trip was most successful from every point of view. Since then, *Skylark* has been busily at work, apparently from Oxford; she seems determined that the reputation of her class shall be maintained fully until the time comes for her to go to the scrap-heap. Then, the class will be extinct; but at Reading there is still a hope that she may yet return there for a few more months of work.

The Harrow Society's New Track

● THE NEW 700 ft. elevated track was officially opened by Mr. R. A. Riddles, C.B.E., member of the British Railway Executive. After being introduced by the chairman, Mr. F. Sedcole, the society was congratulated on its efforts of the past 12 months.

Unfortunately, the event was not favoured with the best of weather—torrential rain fell during the ceremony, but this did not deter Mr. Riddles from driving a 5-in. gauge locomotive round the entire track. Rain continued to fall, but did not in any way damp the spirits of those present and several locomotives were fully occupied in hauling passengers later in the afternoon.

Colonel Harold Rudyard, retired motive power superintendent, British Railways; Sir William Wood, late of L.N.E. Railway and now President of British Railways Sports Grounds; Mr. Chadwick, architect of British Railways; and Messrs. George Dow, Jeffrey Coaker and John Vidal, members of the Institution of Locomotive Engineers, were also present.

A few improvements have yet to be made, but during the summer months, no doubt full use has been made of the track, and invitations are extended to other societies to join in the meeting at the track, to be held on September 12th. The hon. secretary, Mr. C. E. Salmon, 11, Brook Drive, Harrow, Middx., will be pleased to give further information.

Railway Carriage Panel Pictures

● FOR A great many years the compartments of most British railway carriages have contained "mural decoration" in the form of photographs or pictures depicting beauty-spots, notable buildings or familiar scenes on the railways concerned. There can be but little doubt that these things have done much to interest the travelling public and even to maintain, or develop considerable goodwill between passengers and railways.

The London Midland Region has lately introduced three series of picture-panels in full colours, and they will be used to replace the former photographs. The panels, some examples of which we have been privileged to inspect, are beautifully reproduced from excellent originals; the three series are (1) travel during the years from 1845 to 1920; (2) notable architectural features in the L.M. Region, and (3) lesser-known beauty-spots in the Region. We are sure that they will please the great majority of travellers in the L.M.R., and will silently carry on the good work of the former photographs.

ELECTRICAL TIMING APPARATUS

AN "M.E." COMPETITION

WE have recently received a letter from Mr. F. G. Buck, offering a prize of two guineas for the best timer, by a reader of THE MODEL ENGINEER, based on the design of his own very successful equipment. To support this handsome gesture, the directors of THE MODEL ENGINEER offer a further prize of five guineas for the best timer to any design, subject to compliance with the following rules :—

(1) The mechanism must not be over-pretentious in design and be of such proportions as to render it readily transportable.

(2) The design must be strictly practicable, and represented by working drawings.

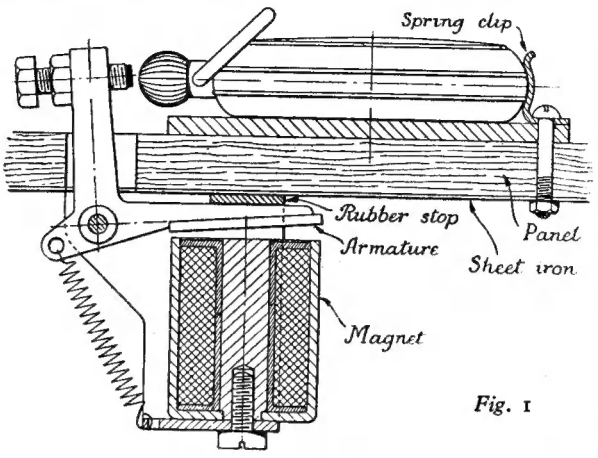


Fig. 1

As a refresher for the old hands, and for the benefit of our many thousands of new readers, we have prepared this review of devices which have, in the past, been described at length in these pages, in the hope that they will prove useful guides to the intending competitors.

In the May 21st, 1936, issue of THE MODEL ENGINEER, "Artificer" wrote an article on an indicating-type apparatus, employing a solenoid-operated stop-watch. (Fig. 1.)

A mechanical relay system was also described (Fig. 2), this apparatus having been constructed by Mr. J. Orme, of the Chesterfield Society of Model Engineers, and used successfully in timing his own boats. The sketch shows the bare essentials of the system, which actually embodied some further refinements.

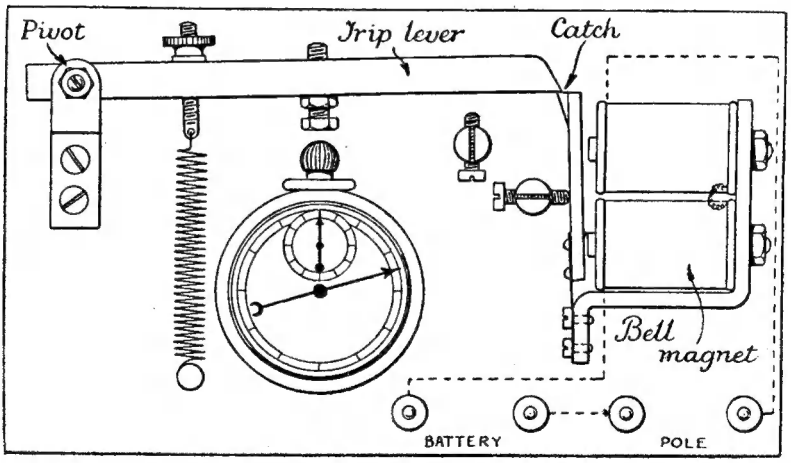


Fig. 2

(3) Entrants must agree to their designs being published in THE MODEL ENGINEER.

(4) The decision of the judges, who will be appointed by the Editor, will be final.

The closing date for the competition will be December 1st, 1951, and all entries must reach these offices not later than the last post on that date.

The electro-magnet employed in this case was taken from an electric bell, together with its armature and leaf spring, and no attempt was made to operate the watch direct. The operation was effected by a spring-loaded trip lever, which was merely released by the magnet and reset

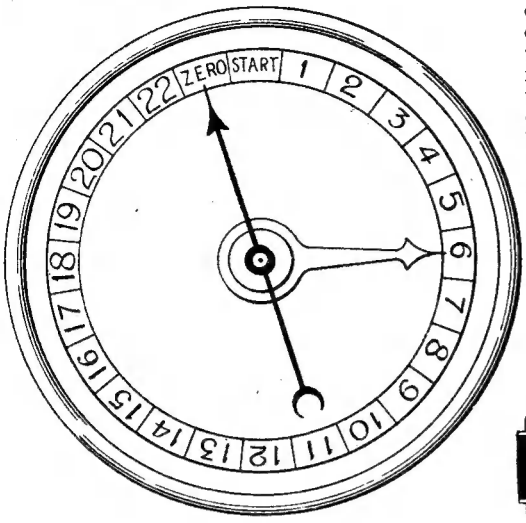


Fig. 3

by hand. It was possible to arrange this catch so that the device was hair-triggered and would work on a current of only a few milliamperes.

In the May 28th issue of the same year, a lap-counting device was described, embodying the aforementioned solenoid operation of the stop-watch, in conjunction with a selector relay with a magnet, identical in size and type to the one which operated the stop-watch, directly connected in series with the battery and pole contact. This was in turn employed to operate the feed pawl of a ratchet wheel, driving it forward one tooth per minute. The shaft of the wheel carried a pointer which indicates the number of laps completed on a dial above the panel. This simple device is known as a sequence (or "step") selector relay, and is shown in its various parts in Figs. 3, 4, 5 and 6.

It should be noted that in this apparatus the stop-watch operating gear is not connected directly in the pole circuit, but instead, is in a relay or local circuit actuated by the lap counter. This is an advantage, because the watch operation

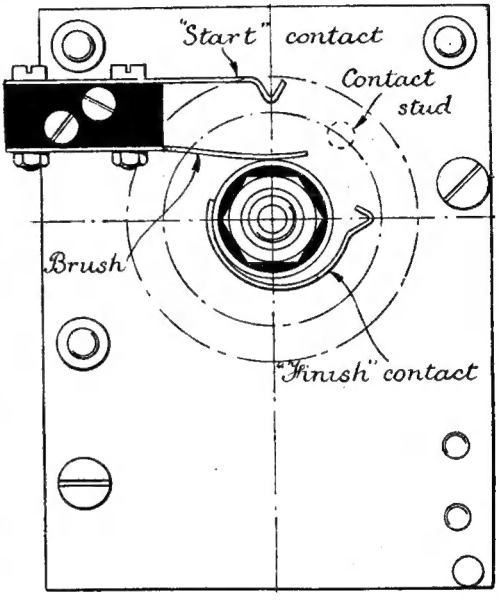


Fig. 5

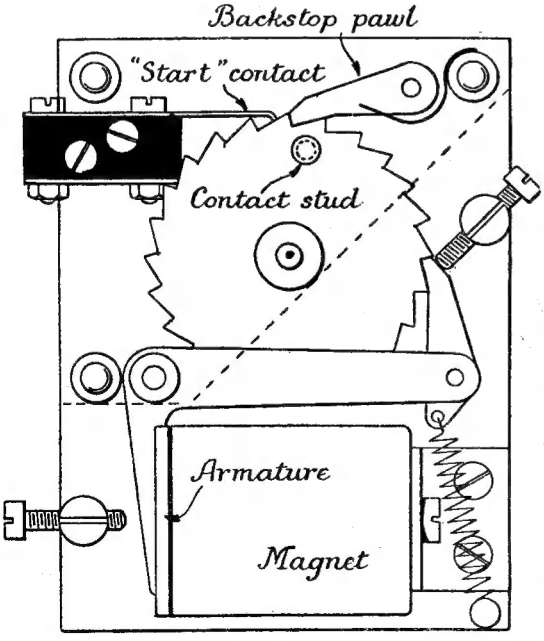


Fig. 4

circuit, which requires a fair amount of energy, and, therefore, a fairly large current, is not subjected to the voltage drop caused by the resistance of the pole leads.

In the April 27th, 1939, issue, P. Ivison described his time and lap-recording apparatus, constructed around an old alarm clock. It differs from the previous devices in that it was fitted with a recording tape which, in a manner of speaking, "printed" a record of laps and time, so that the time taken for any number of consecutive laps, or any individual lap, could be ascertained after the conclusion of the run. (Fig. 7.)

In operation, the lever movement of the old alarm clock was found to give 200 beats to the minute, which meant that the escapement wheel passed 100 teeth per minute. Mr. Ivison, therefore, decided to fit a make-and-break, to engage on the teeth of the escapement wheel, and this consisted of a fixed brass bar with a platinum point, this bar being made from hard-

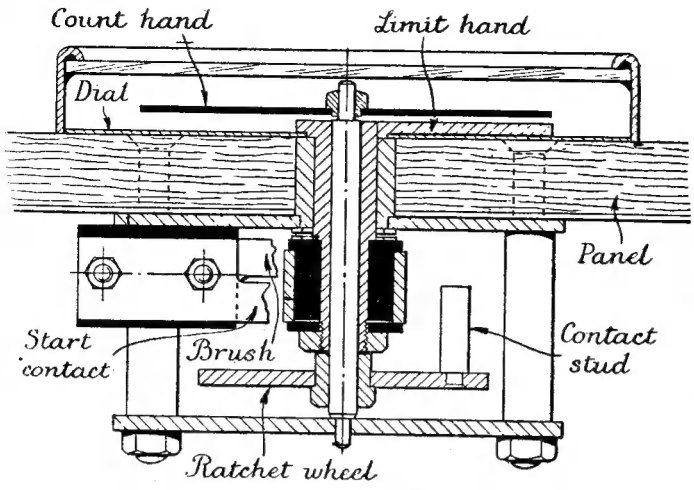


Fig. 6

rolled brass 0.002 in. thick and set so that its spring closed the platinum points. Each tooth on the escapement wheel engaged on a tiny steel block on a flexible bar lifting it only a small amount, just enough to break the circuit. Both these bars were mounted on a small block of ebonite, the latter being secured to the framework of the clock and made adjustable. Two leads, one from the flexible bar and one from the fixed bar, went to a solenoid with 1½-2 volt battery in the circuit. Thus, the left-hand solenoid operated the left-hand pen, and gave the time jig seen on the paper in the illustration, and the right-hand solenoid was operated by a make-and-break pen, giving a jig each time the model completed a circuit.

The gear for running the paper was made up from odds and ends, and a gramophone governor was fitted to regulate the speed to give jigs about ½ in. long ; this facilitated easy division to get the decimal points on the time side of the " printed " record.

In the March 8th, 1945, issue, Mr. F. G. Buck described his very efficient apparatus, a development of the type described by " Artificer " in the May 28th, 1936, issue. The wiring diagram of the timing circuit and the layout of the apparatus are again reproduced here for the benefit of our new readers. As a matter of interest, the whole works are accommodated in a case 8 in. × 4 in. × 1¾ in. overall. (See Figs. 8, 9 and 10.)

Finally, in the issue dated December 26th, 1946, Mr. L. P. Purple described the apparatus he built for timing the hydroplanes of the Blackheath Model Power Boat Club. This was also based on a design published by " Artificer " back in 1936 and proved very satisfactory on final tests. The line drawings published herewith will enable readers to form a clear impression of its operation if referred to in conjunction with the following explanation. (Figs. 11, 12, 13, and 14.)

At the commencement of a timed run, the finish hand (*A*) is first set to the appropriate division on the dial to give the required number of laps, and the lap counter hand (*B*) is in the " zero " position. Contact is made at the first half lap on the tethering pole head, and current flows through the electro-magnet (*C*). This attracts the armature, and hence feeds the lap counter hand round one division. Simultaneously, contacts (*D*) and (*E*) close, the electro-magnet (*F*) is energised, the armature of which is attracted, and the adjusting screw (*G*) in the upper limb of the bell-crank lever strikes the press button and starts the watch. On the completion of each subsequent lap, the lap counter

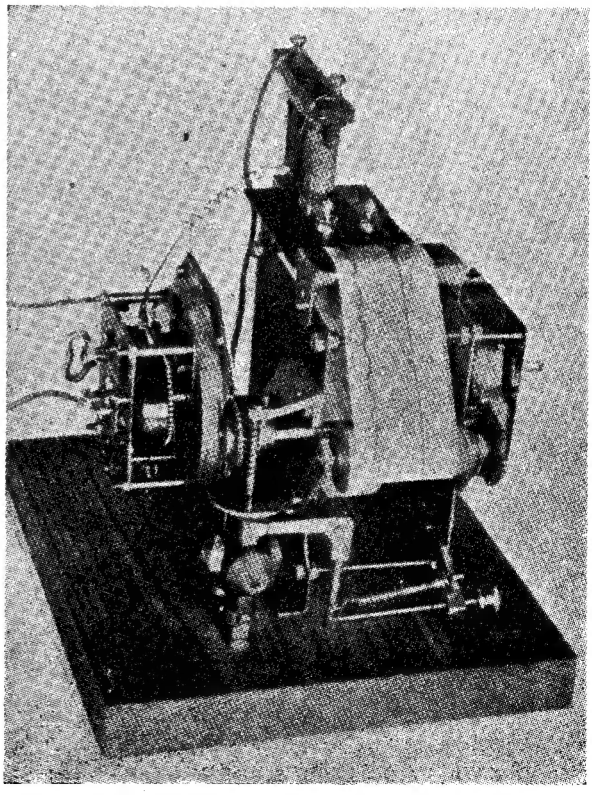


Fig. 7

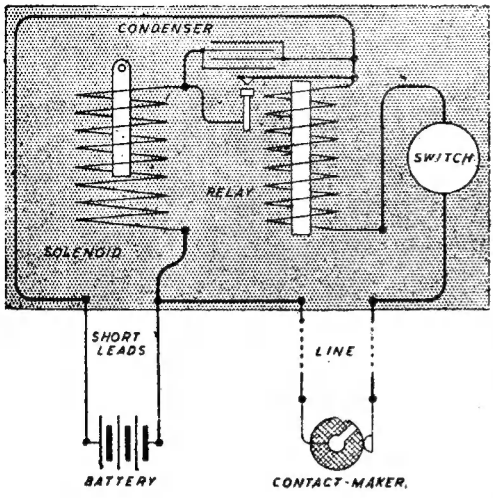


Fig. 8

moves round one division until eventually it comes in line with the finish hand. When this is reached, contacts (*H*) and (*E*) close, current is again passed through the electro-magnet (*F*) and the watch is stopped automatically. Press-button switches are fitted to both magnets to enable the lap counter hand to be reset, and also to apply the third pressure to the stop-watch button, which is required to bring it back to its original zero position.

As initially constructed, the apparatus proved to have one or two minor defects which occasioned some bother. When current passed through the lap-counting mechanism, the impulse given to the ratchet wheel was sufficient to rotate the spindle two or three divisions, instead of one. This occurred when using a 6-volt motor-cycle accumulator. It was positively prevented by fitting a projecting stop to the heel of the operating pawl, which locks the ratchet wheel when the armature is touching the electro-magnet. It was then discovered that if the electro-magnet operating the watch was energised by a very brief contact, made whilst the lap counter hand was in the process of moving from one division to the next, the time available was far too short to overcome the mechanical inertia in the armature and its bell crank ; consequently, nothing happened. This trouble was overcome by allowing the main contacts to stay closed after the lap counter had moved one division, and the provision of subsidiary contacts on the ratchet

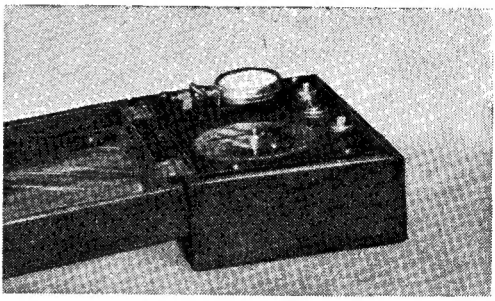


Fig. 11

bell crank, which remained closed as long as the contacts on the pole head were bridged ; this gave a long enough closed period to ensure the satisfactory operation of the watch, and furthermore, it could, if necessary, be lengthened by extending the contact plate on the head, so

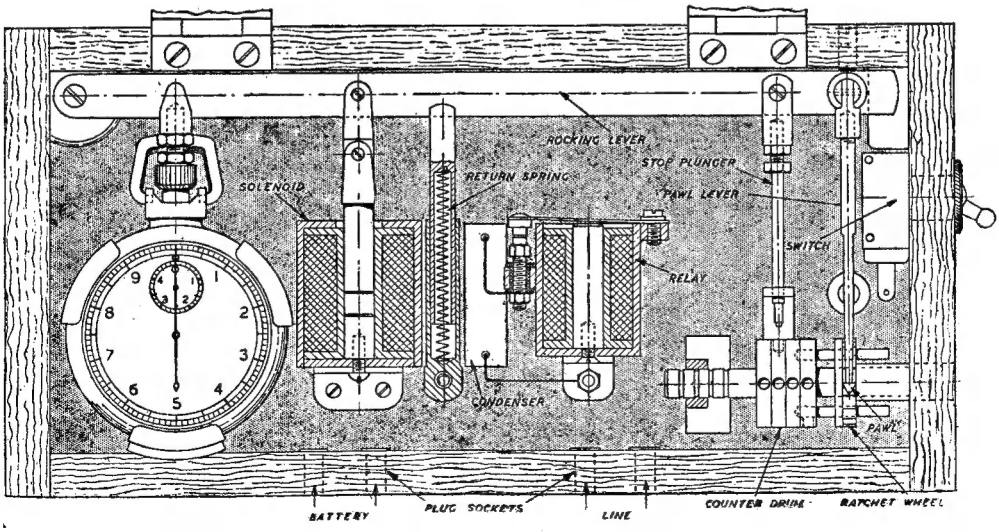


Fig. 9

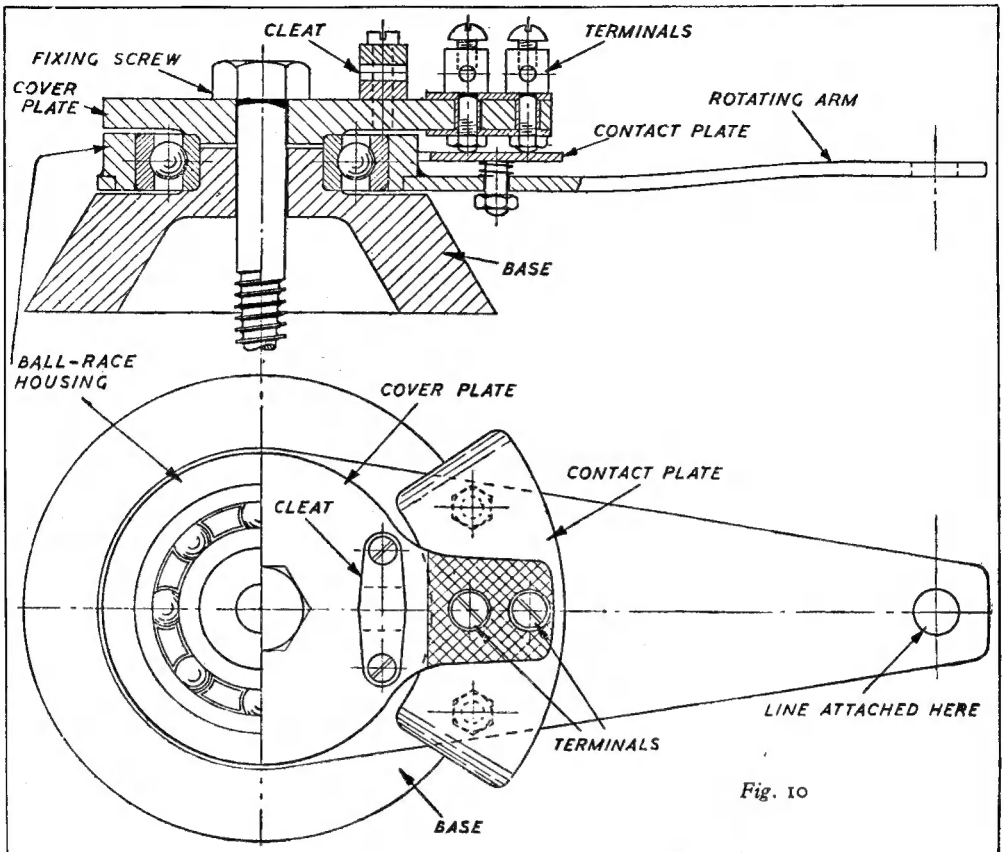

CLEAT
TERMINALS
FIXING SCREW
COVER PLATE
ROTATING ARM
CONTACT PLATE
BASE
BALL-RACE HOUSING
COVER PLATE
CONTACT PLATE
CLEAT
LINE ATTACHED HERE
TERMINALS
BASE

Fig. 10

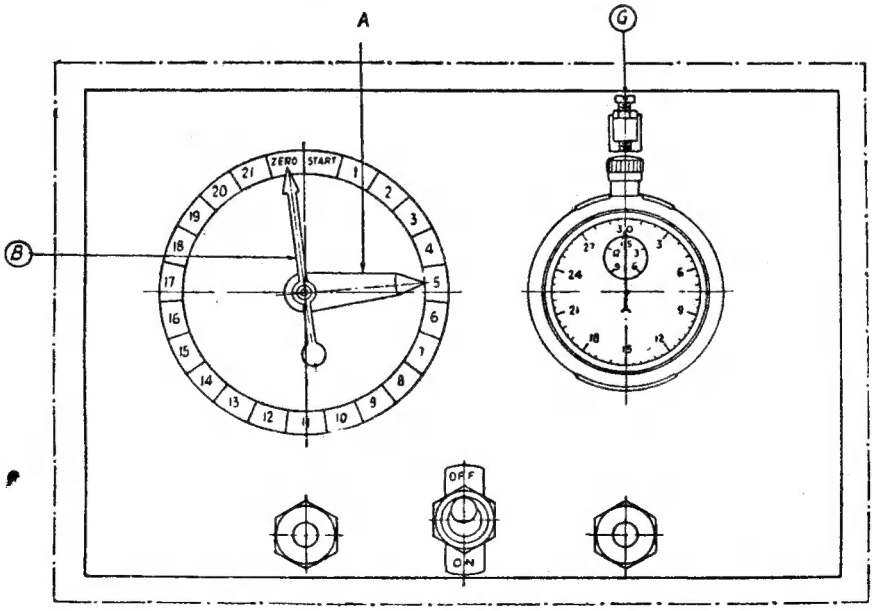

A
G
B
ZERO
START
OFF
ON

Fig. 12

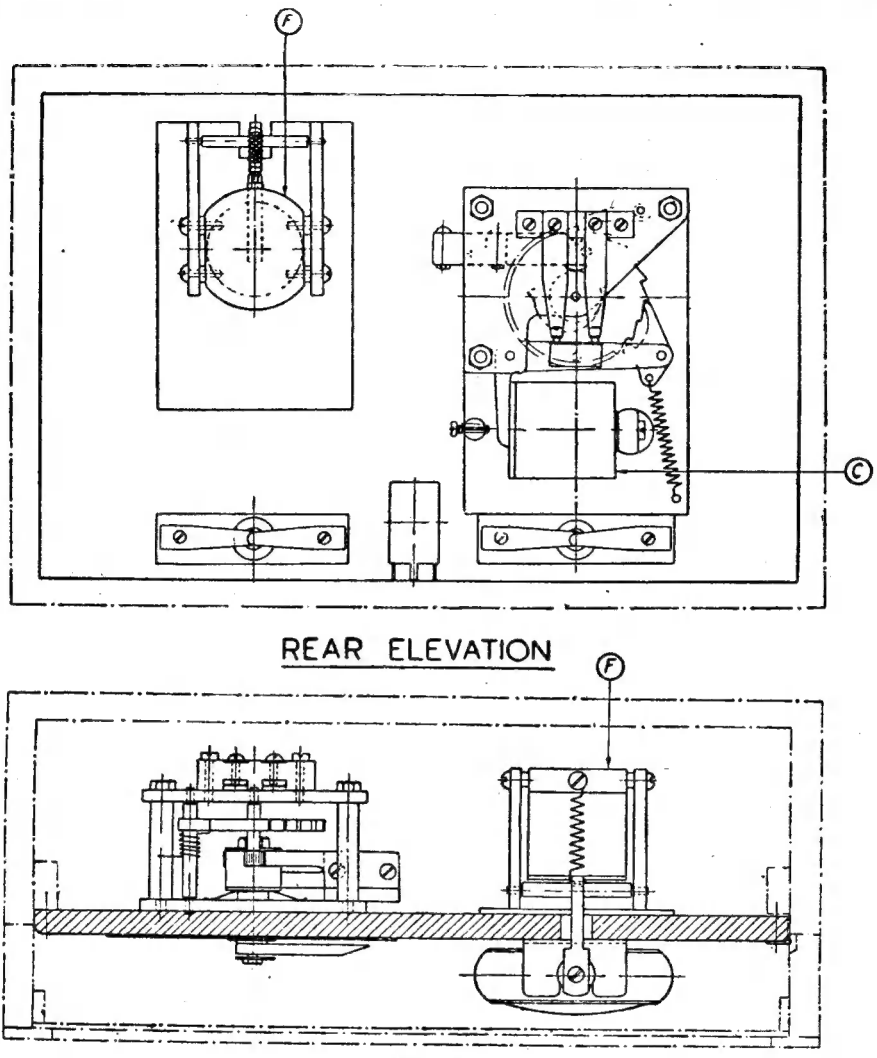
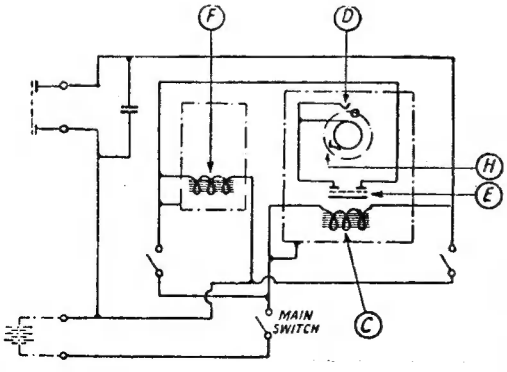


Fig. 13



Left—Fig. 14

increasing the angle of arc over which contact was made.

On the head in use at the time the article was written, the arc was in the region of 20 deg., and it was tested up to approximately two revolutions per second (equivalent to a boat speed of 400 m.p.h., on a 100-yard circuit) before the stop-watch operating mechanism failed to respond.

*"That Wonderful Year....."

by "The Dominie"

AT this point I can introduce Carrett's steam-pump, which has been adopted by the Royal Commissioners in the boiler-house. Shown in Fig. 42, the steam-cylinder is on the top of the A-frames; the piston-rod drives upwards to a cross-head, from which return connecting-rods drive down to the crankshaft. A tail-rod is also fitted to the steam piston, driving down to a cross-head which is slotted horizontally to clear the crank as it revolves. The water-pump ram is driven from this cross-head, and may be disconnected quite easily to allow the engine to work as an ordinary high-pressure stationary engine to drive machinery.

Lynch & Inglis have a pretty little steeple-engine somewhat similar in appearance to one of Maudslay's marine-engines, the piston-rod driving a forked connecting-rod to a cross-head above, with return connecting-rod to the crank. The firm have also mounted one of these engines on a wheeled platform, with a vertical boiler, and so made a neat portable engine of it (Fig. 44), "peculiarly adapted," as a contemporary account puts it, "for agricultural and general purposes,—such as crushing seeds, hoisting goods, pumping water, etc."

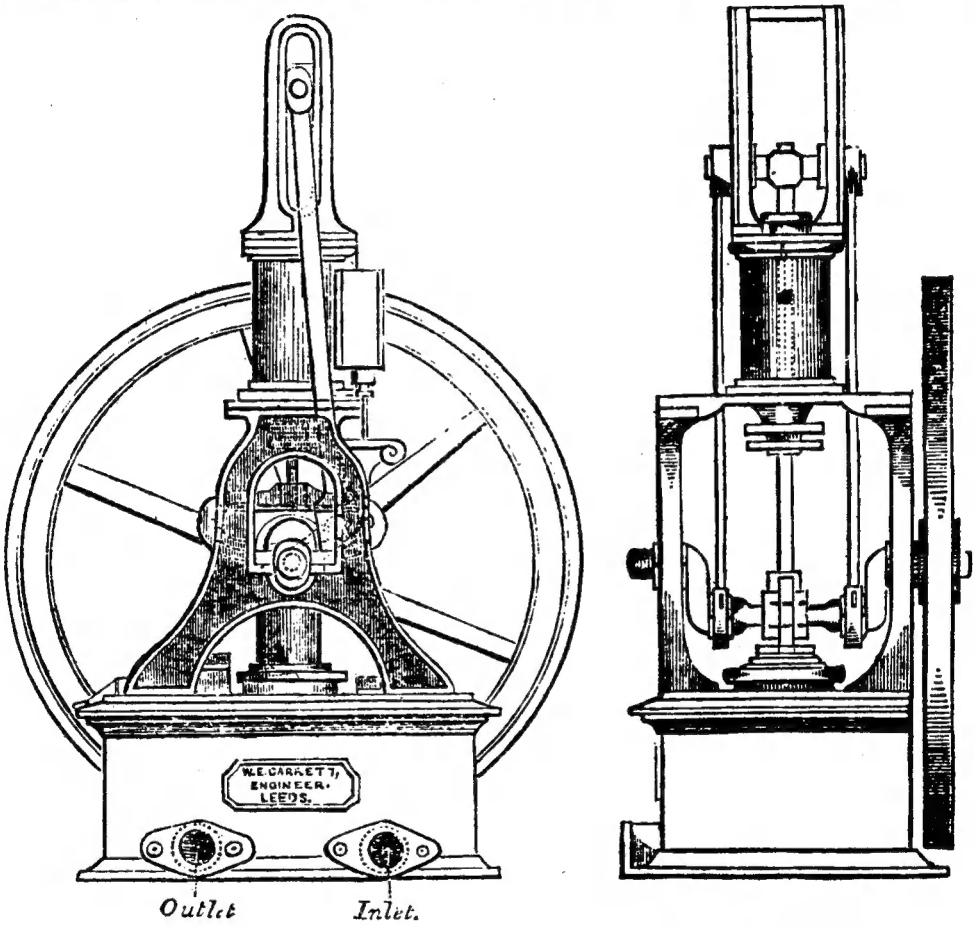


Fig. 42. Carrett's steam-pump could be used as a stationary engine or a pump or both, and was built in six capacities from 700 to 6,000 gals. per hour

*Continued from page 143, "M.E.," August 2 1951.

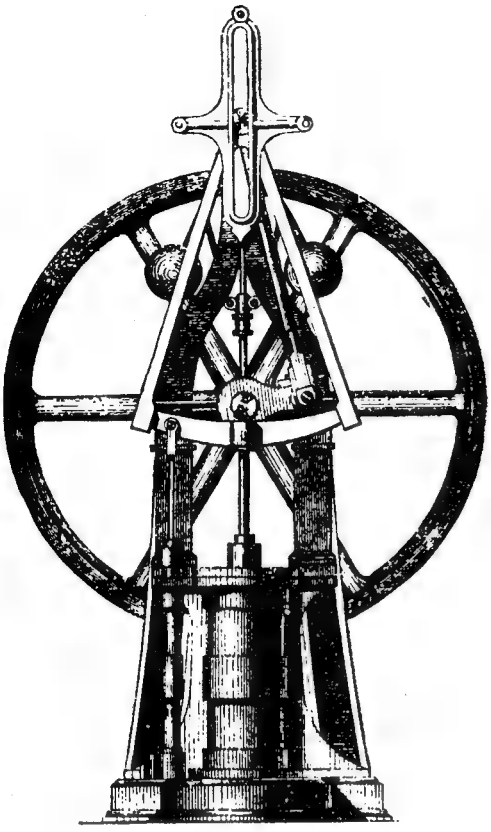


Fig. 43. Stationary steam-engine built by Lynch & Inglis, of Manchester, "for agricultural and general purposes"

Very many steam engines of more or less orthodox design are on show, some on stands of their own, and many driving other machinery in the textile, printing, and similar sections. But besides the orthodox ones, there are numbers of "rotatory," "disc," and similar types of which their fond inventors have high hopes, but which for various reasons, including machining and packing difficulties, are fore-doomed to failure, or at least to a short life and a gay one.

Such is Simpson & Shipton's "Patent Short-Stroke Reciprocating Steam Engine," shown in operation driving cotton-spinning machinery (Fig. 45). The "cylinder" or steam-chamber A is actually rectangular in section, with semi-cylindrical ends, and the "piston" *B* is a cylinder sliding between the walls and rotating, as it slides, on the shaft *C* to which it is keyed. As shaft *C* rotates, it must perforce slide sideways, and slots are cut in the end walls of the steam-chamber to allow of this. Also, as the shaft rotates it carries round the two cranks, which are connected to the lower cranks by the side-rods *H*. Steam is admitted by a slide-valve, which exhausts through its back, and is worked by an eccentric and bellcrank. Plate *D* is spring-loaded to compensate any wear which takes place in the periphery of the piston.

The chief advantage claimed is that the revolving motion reduces the jar at each end of the stroke, but one imagines that leakage would soon take place past the ends of the piston and through the slots, which will be difficult to pack.

Reverting to the more conventional types of engine, we may notice rather a nice horizontal engine by Turner's of Ipswich, in which separate pedestal bearings are bolted to cast brackets on the flat soleplate, to the side of which the boiler feed-pump is bolted. The cylinder is bolted to the bed-plate, and two slide-bars only support the cross-head. The regulator-lever works in a horizontal quadrant on top of the valve-chest.

Another more or less orthodox engine is shown by Ransomes & May, also of Ipswich (Fig. 47). This time, however, the crank is overhung and the flywheel between the bearings. An unusual feature for a stationary engine of this era is the marine-type big-end of the connecting-rod, by the bye.

Might I suggest that a model horizontal engine, "dressed up" with some of the features of these period pieces, would form a much more interesting engine to build, run and exhibit than many of the quite ordinary-looking ones seen at exhibitions from time-to-time. The engine shown in Fig. 47, for instance, would not be difficult to build, and even a beginner should be able to achieve an "authentic" appearance with an engine of say $\frac{3}{4}$-in. bore by $1\frac{1}{4}$-in. stroke. You'll think about it? Good!

Well, as always, time is running on, and we haven't seen a quarter of the things I had wanted

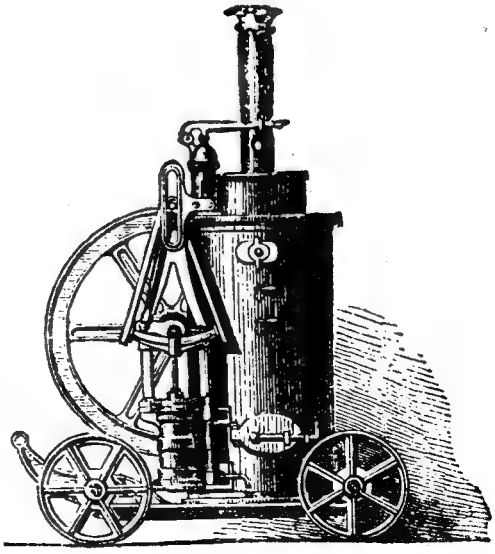


Fig. 44. Portable steam-engine by Lynch & Inglis, using their stationary engine with a vertical boiler

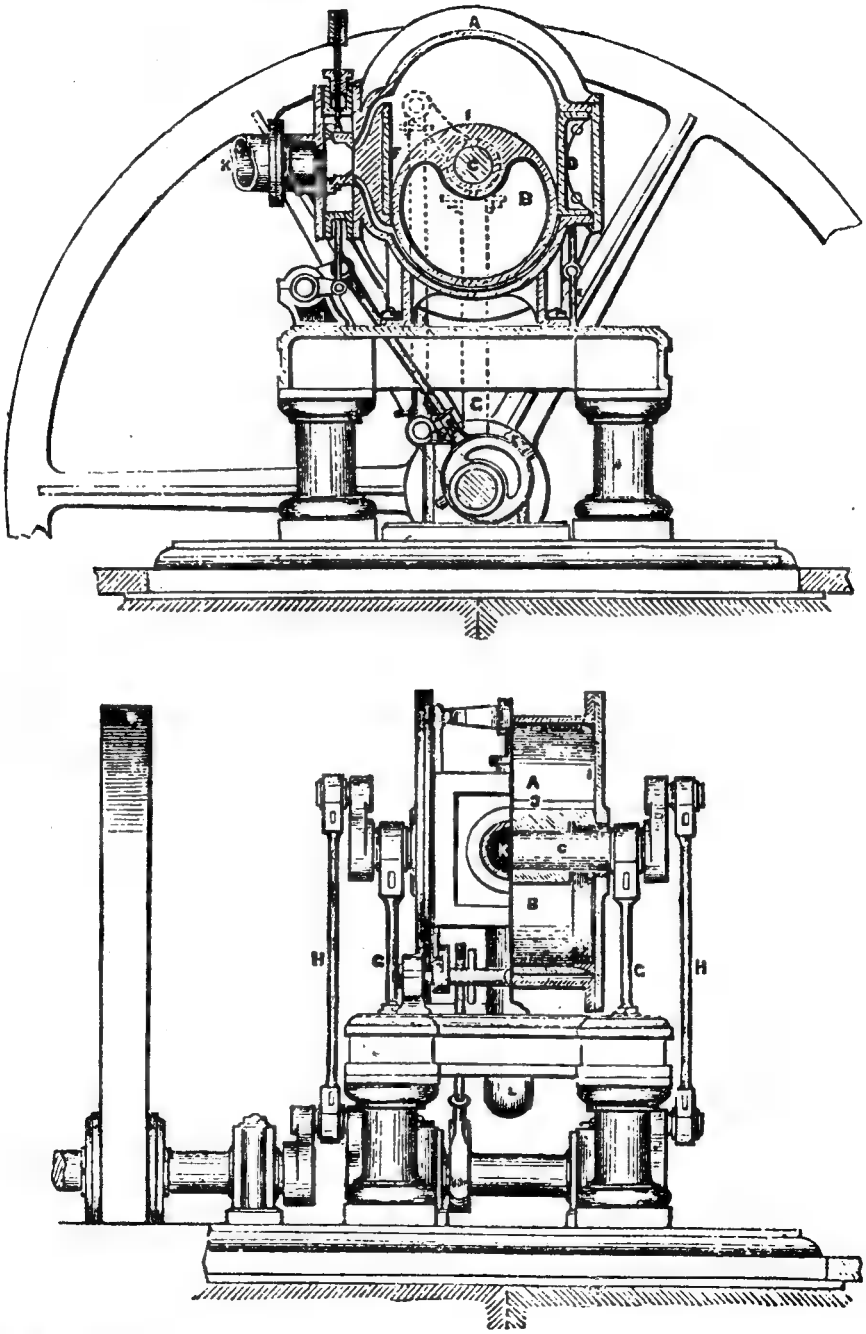


Fig. 45. Simpson & Shipton's patent short-stroke engine was shown at work in the Crystal Palace, driving textile machinery

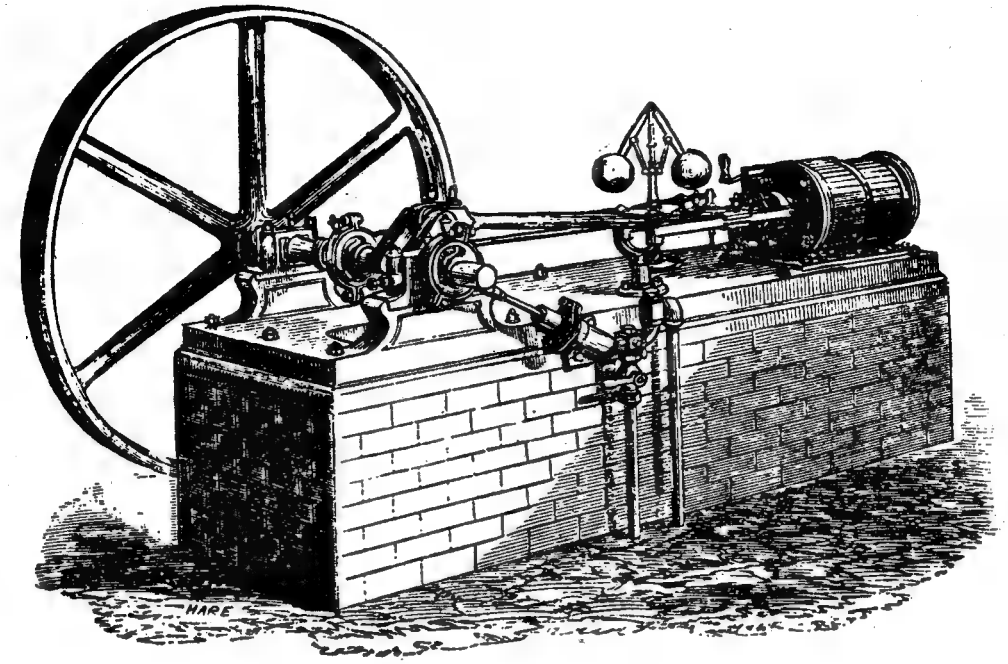


Fig. 46. Horizontal steam-engine by E. R. & F. Turner, of Ipswich, with wood-lagged cylinder

to see. All exhibitions seem alike in that respect, don't they? But when we've had some refreshment, there'll be just about time to have a final look round the show before our Time Machine transports us to our own century again.

(To be continued)

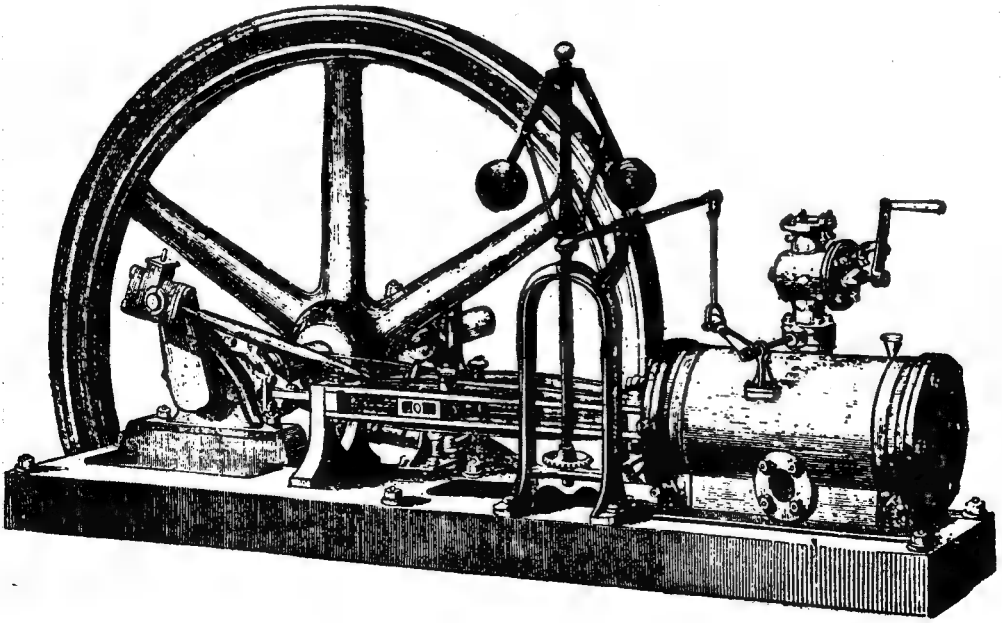


Fig. 47. A pretty horizontal engine by Ransomes & May, which would make a "different" model from more common types

The "Verdict" Dial Test Indicator

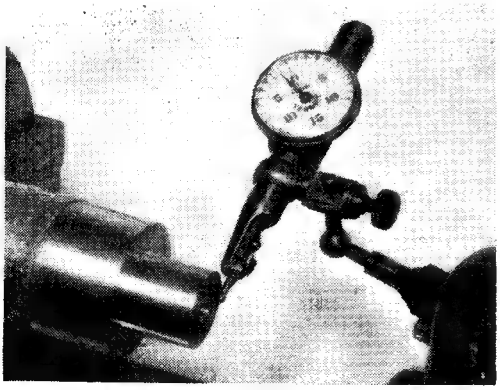
MESSRS. THOMAS MERCER LTD., of Eywood Road, St. Albans, Herts. have submitted for our examination a sample of their new *Verdict* Dial Test Indicator, an instrument of highly ingenious and versatile design which will have a strong appeal to all precision engineers. This is made in two models, namely, the "Unitest" and the "H.E.", the latter being the one actually examined, and though the two models are generally similar in mechanical principles, they have certain differences in external shape and construction, also in the methods of clamping.

The model "H.E." indicator with toolpost holder, in case

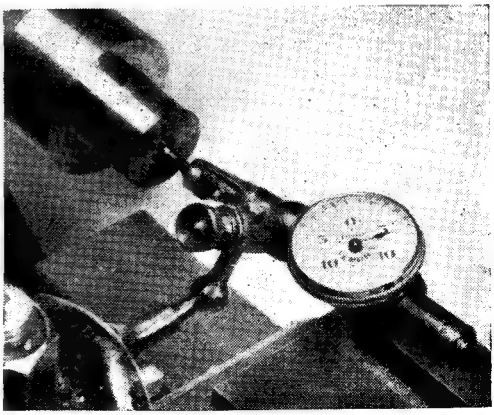
Among the most useful features of the *Verdict* indicators, especially for dealing with small work, are their compact size and the methods of clamping and adjustment, which enable them to be used in cramped or awkward positions where the standard types of dial test indicators cannot be applied. The "H.E." has a cylindrical body only $\frac{3}{8}$ in. diameter × 2 21/32 in. in over-all length with a dial approximately 15/16 in. diameter, having the usual rotatable bezel for zero setting, the range being 0-15-0 in increments of 0.001 in. It is equipped with an ingenious universal clamp, which provides for rotational adjustment on the axes of either the clamp or the body, so that it can instantly be set to any compound angle. In addition, the clamp can be fitted to the upper part of the gauge body, and a further device to increase the versatility of the clamping arrangements is the $\frac{1}{4}$ in. diameter adaptor, which can be screwed into the top end of the body, and when not in use, it can be reversed and screwed in flush with the top of the gauge. The body clamp enables the indicator to be attached to the scriber of an ordinary scribing block or surface gauge, but for mounting it in the lathe a rectangular holder can be provided, and this also is fitted with a universal swivel to enable the clamp to be set at any angle.

The ball contact point of the indicator is pivotted near the extreme tip of the body, and operates a multiplying lever which extends inside the body to engage, in turn, with a further multiplying worm gear behind the dial. By arranging the mechanism in this way, the instrument is equally suitable for external or internal use, requiring no attachments in either case, and if necessary, the end of the body can be entered into

(*Continued on page 214*)



The indicator in use on external work

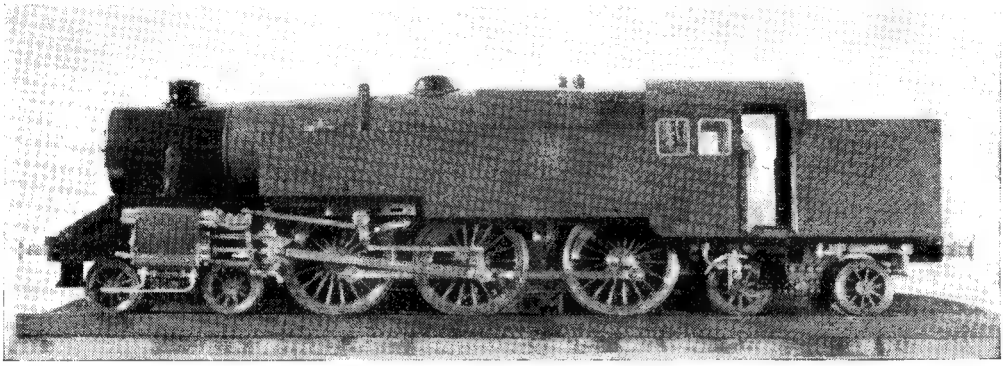


Using indicator to test internal surface

"Doris" as a Tank Engine

by "L.B.S.C."

FROM time to time, readers who prefer tank engines to the tender variety, want to know why I don't include a fully-detailed description of a hefty tank engine in these notes, suitable for 3½-in. gauge, on the lines of the old favourite *Helen Long* of earlier days. One reason is, that tender engines are more in favour with the majority of followers of these notes. The open-backed cab is handier from the point of view of a driver sitting on a following car, to say nothing of the "personal appearance" aspect; I just hate to see a little tank engine running around minus cab roof and back sheet. Secondly, a long rigid engine is a drawback on continuous tracks with average radius curves; the rear end of *Helen Long* herself, was well over to one side of the rails, on a curve, and instead of the coupling between engine and first car being central and straight, the buffer beams of engine and first car, and the coupling, formed the letter Z. The consequence was, that with a decent load, the coupling always tried to straighten out; and the side pull on the engine drawhook, caused more than one derailment of the trailing end. With a tender engine, there isn't much distance between the trailing axle and the buffer beam, and you get a fairly direct pull with the minimum of flange friction.

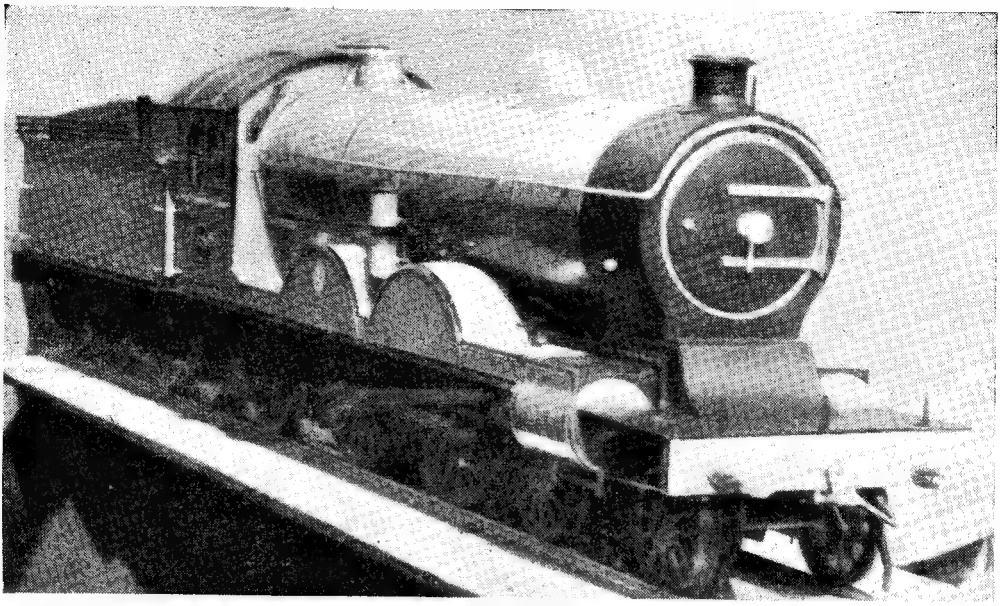


Major A. B. Compton's tank version of "Doris"

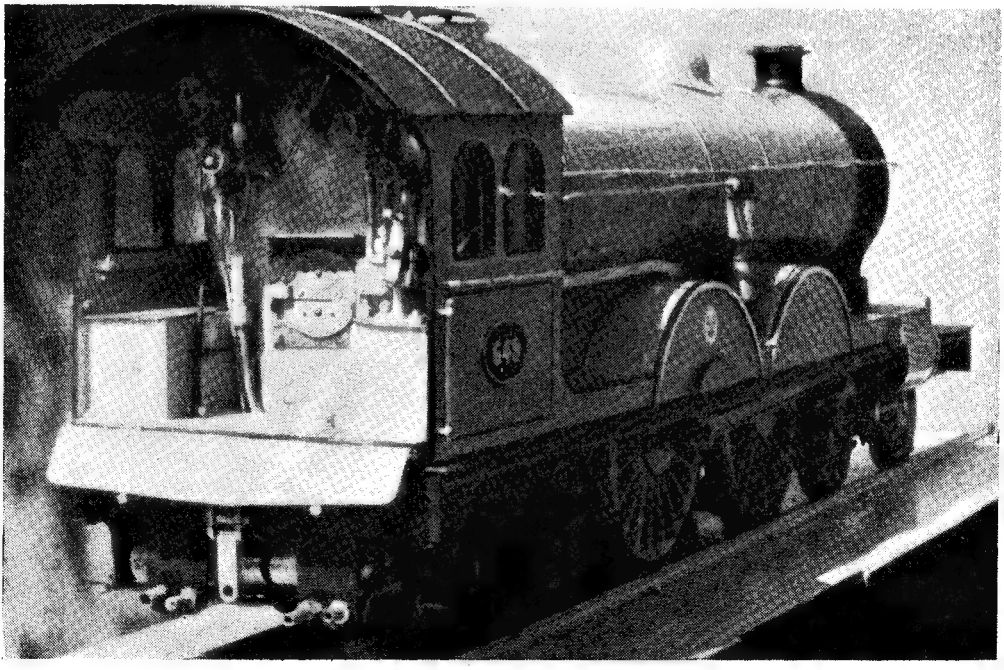
However, anybody who fancies a powerful, good-looking, and efficient big tank engine on 3½-in. gauge, could with advantage, follow the good example of Major A. B. Compton, and utilise the drawings and instructions given for *Doris*, the L.M.S. class 5 engine recently described. Our worthy friend lengthened the main frames, to accommodate another bogie, closed in the back of the cab, added a bunker and the necessary trimmings, and hey presto! there she was, all-present-and-correct-sergeant. One of the principal reasons for the tank engine variation was that Major Compton is an Army officer "in commission," and as such, was liable to be shifted about from place to place, so he thought that the self-contained tank engine, being shorter, would present advantages both in construction and portability. Living at the time, in a flat, was another disadvantage; a circumstance that will excite sympathy among many other flat-dwelling readers who have a yen for locomotive building. However, as the reproduced picture shows, the job was done, and mighty fine, too, as Bill Campbell would remark. Personally, I think she is a better type of locomotive than the class 4 British Railways standard 2-6-4 tank engine. Many drivers have their own likes and dislikes about various wheel arrangements; and the 2-6-4 type has been regarded with suspicion among many of the fraternity, ever since the wreck in August, 1927, when 800 *River Cray* came off the road near Sevenoaks, whilst running a Cannon-Street to Deal express. Had it not been for Shoreham Lane bridge being in the way, Driver Harry Buss would have stopped her, with nothing worse than a derailment; but she hit the bridge, turned over, and the coaches at the front end piled up, resulting in death and injury to some of the passengers. Unfortunately, this gave the type a bad name; and the Southern Railway rebuilt all the 2-6-4 tanks as tender engines. Incidentally, one of them went past my window at a tidy lick, with a through excursion train from the L.M. Region, only a few minutes ago, at time of writing.

No Cause for Alarm!

It was proved beyond a doubt, that the accident was not due to the wheel arrangement, nor the design of the engine generally; but the advent of the 2-6-4 L.M.S. type tanks (the new standard class 4 B.R. jobs) on the Southern Region



Mr. W. Tucker's 3½-in. gauge N.E.R. Atlantic



Footplate view o the "Gateshead Infant"

caused a certain amount of misgiving among drivers called upon to work them on fast trains. Happily, their steady-riding qualities, combined with snappy acceleration and free running, have dispelled all doubts and fears ; and speeds up to 70 m.p.h. are often indulged in, on favourable stretches. I've often had a quiet chuckle at the thought that anybody inclined to be a wee bit timid, could easily have run bunker first with the bogie leading, and wouldn't have got any smoke and steam in his line of vision ! In the old days of steam suburban traffic, we used to run as many miles bunker first as chimney first, and it never worried either the enginemen or their iron horses. At the same time, anybody who has sampled the grand riding qualities of the Baltic tanks of the old L.B. & S.C. Railway would naturally prefer the 4-6-4 to the 2-6-4 wheel arrangement ; and for that reason, would rather have the type of engine shown, than the standard class 4. Still, all that is by the way.

A Little Extra Power

Our friend the Major made some departures from the original design, in his adaptation of *Doris*. In view of the extra weight on the coupled wheels, caused by the side tanks, he enlarged the cylinder bores to 1¼ in., made the boiler from thicker copper sheet, and pressed it to 100 lb. per sq. in. This little bit of pepping-up was kind of "over-successful," as the engine will lose her feet if not properly handled. The boiler hasn't the slightest difficulty in making more steam than is ever required by the big cylinders. As to performance, it is quite up to "Curly guarantees." Last Whitsun, Major Compton took the engine to the Malden Club's line, and she hauled fourteen children at a time, on three passenger cars, without the slightest difficulty. I could mention one or two much larger engines of somebody else's design that couldn't equal that performance !

An Injector Tip

The engine has an injector which the Major made to my specifications, and it works, just as I said that it would, up to 90 lb. pressure ; but then it knocks off, and our friend wonders why. Simple, my dear Watson, as Sherlock would have said. I design my injectors for the greatest possible working range ; that is, from blowing-off point, down to almost nothing. As I usually recommend a working pressure of 80 lb., I reckon to give the injectors only a few pounds latitude above that ; and my own personal experiments with the type and size of injector suitable for 3½-in. gauge engines—described in these columns, and in the *Live Steam Book*, resulted in the throat diameters given, viz. steam cone 63 drill, combining cone 70 drill, and delivery cone 75 drill. This setting, combined with the proper tapers and spacing, gives the range mentioned above. The rule is, higher pressure, less steam, more water ; lower pressure, more steam, less water. All our friend has to do, is to make up a fresh steam cone with a slightly smaller throat diameter, and either reduce the tip of the nozzle a weeny bit to let more water pass, or reduce slightly the amount it enters the combining cone. This is about the easiest way of making the adjustment ; there are other ways, naturally, which can also be used to vary the steam consumption, and the quantity of water delivered. The water in the tanks gets fairly hot and puts the injector out of action, at times ; but this is a common fault with full-size injectors, unless they are specially designed for hot water feeding. The boys who operated R.O.D. locomotives in the Middle East, during the Hitler war, could spill sackloads of beans on that subject—and in terms which would make the water boil ! Readers who are not conversant with injector lore, should note that when the highest working pressure is raised, the other end of the working range is also raised ; for example, if the 80 lb. injector cuts out when the pressure is down to 10 lb., the 100 lb. injector will cut out somewhere about 30 lb. Full-size injectors are subject to the same rule.

Since the photograph was taken, steam brake gear has been fitted, also a few trimmings representing full-size practice ; and I guess that all readers will join in heartily congratulating Major Compton on a good job well done.

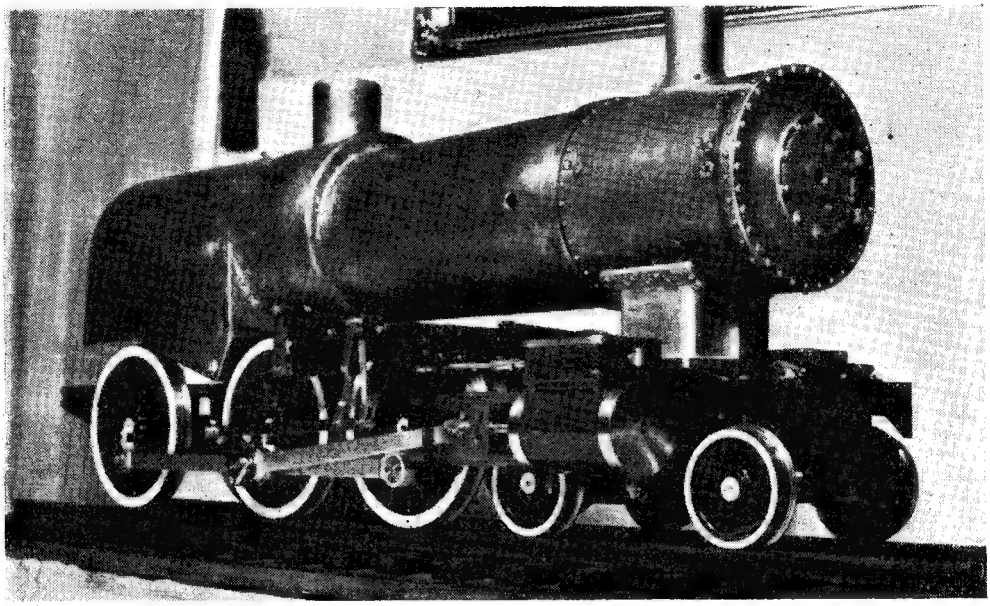
A "Gateshead Infant" in 3½-in. Gauge

The reproduced photographs of a little North Eastern class "V" Atlantic locomotive will provoke feelings of nostalgia among our craft brotherhood up North. The big engines were among the finest of their day, both for appearance and performance ; and in his small reproduction, Mr. Wilfred Tucker has certainly "captured the proper atmosphere," in a manner of speaking. Mr. Tucker, by the way, is a worthy son of a worthy father, "dad" being the Mr. A. W. Tucker whose magnificent work on engines like *Lady Anna*, the four-cylinder *Lord Nelson* class engine with Holcroft valve gear, the 3½-in. gauge Garratt, and the G.W.R. type 4-4-0 which he called *Cityanna*, is well known to followers of these notes, and visitors to the "M.E." Exhibitions. Incidentally, the engine portrayed here, will be on show at the New Horticultural Hall, so readers will be able to inspect it for themselves, if they visit the coming Exhibition.

I have no details of the little engine, but all her measurements, and dimensions of working parts, are in proportion to those of her big sisters ; and as the photographs show, she is fully detailed according to the "Tucker tradition." It is hardly necessary to add that she works as well as she looks, same as the rest of the bunch. *Cityanna* mentioned above, recently helped to open the local S.M.E. track, and showed the members "the rounds of the kitchen" in no uncertain style. Friend Tucker, who is partial to the older types of locomotive, is your humble servant, is now busy on a Caledonian *Dunalastair* 4-4-0, and has adapted the link motion I specified for *Molly*, to suit it. He says that as such excellent results were obtained from the Joy gear on *Cityanna*, adapted from the gear I described for *Miss Ten-to-Eight*, he considered using that on the "Caley" job, but was afraid of being haunted by the ghosts of Drummond and McIntosh ! Incidentally, I'd dearly love to hear old Dugald's opinion of the spam cans and the now defunct *Leader* !

My prophesy that the latter freak monstrosity would never do any work, has been absolutely and completely fulfilled ; and the boys at the Eastleigh Works were so glad to see the end of it, that when it was towed out of the scrap sidings on its final journey, they decorated it with wreaths and flowers, and gave it a proper funeral. The poor unfortunate L.B. & S.C. Railway inside of the boiler will be to Curly specifications, and the steam well superheated.

As to the valve-gear, the link is a fixture on the frame. The dieblock is connected by a pendulum link, to the eccentric rod operated by the return crank. The end of the eccentric rod is connected to the horizontal arm of a bell crank, rather indistinct in the photograph, being painted black.



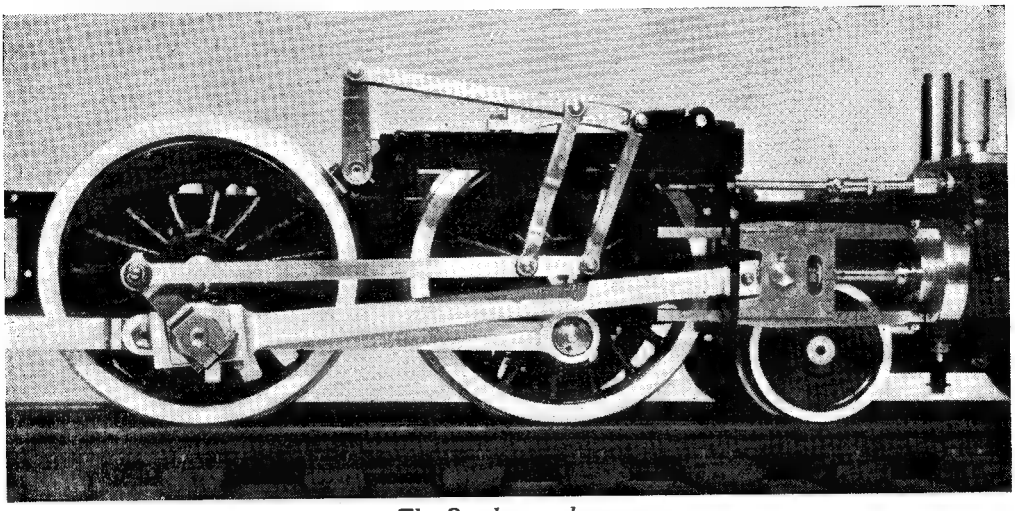
Mr. W. S. Van Brocklin's latest job

Atlantic which acted as "guinea-pig," to try out the sleeve-valve cylinders—an idea long since found useless by the motor industry—has also gone to a premature grave. *What* a waste of valuable time and money—nuff sed !

Southern Valve-gear

A correspondent who is a new reader, but intensely interested in small locomotives, and has started on *Tich*, wants to know whether the Southern valve-gear had any connection with our own Southern Railway of pre-nationalisation days ; and if so, could he fit it to his own job. I dealt with the Southern valve-gear many years ago ; but maybe a few words about it here, may interest other newcomers to our craft. The gear is a horizontal variation of the well-known Hackworth gear, operated from a return crank, and was designed by a driver (engineer, to our trans-atlantic friends) on the Southern Railway in U.S.A. A close-up of it is shown in the accompanying photo-reproduction. This particular specimen is the handiwork of Mr. W. S. Van Brocklin, the builder of the Tilbury tank engine recently illustrated. Bill's present job is a 4-6-0 of a type once popular in U.S.A. before the advent of the much larger locomotives that did all the work before diesels became popular. Bill is making a very fine job of her, as you can see ; the The vertical arm of the bell crank, hangs down and is connected to the valve spindle. In the position shown, mid gear, the pendulum link swings in an arc, the ends of which are at the same height, and the only motion given to the valve spindle, is the lap-and-lead-movement, the eccentric rod acting exactly the same as the combination lever of a Walschaerts gear. When the reverse lever is pushed forward, the dieblock moves to the front end of the link ; and the arc in which the pendulum lever swings, is then higher at the *back* end. This causes the end of the eccentric rod attached by the connecting-bar to the bell crank, to move bodily up and down, transmitting its movement to the valve spindle via the bell crank, and operating the valve for forward motion. When the dieblock is pulled to the back of the link, the swing of the arc is higher at the *front* end, reversing the movement of the valve, and consequently the direction in which the engine runs. The lap-and-lead movement is constant at any position of the dieblock in the link.

Readers who are hazy about the exact way in which the gear operates, should make up a "working diagram" with strips of cardboard and pins ; or better still, strips of metal and small rivets, say to about four times the size of the photograph, which may be used as a "working



The Southern valve gear

drawing." Watching the operation of the rods and links, when turning the return crank slowly by hand, will convey more information in a few minutes, than you could gain in hours by reading written explanations. I make up working dummies of all my valve gears, and that is one reason why I can always guarantee results on engines built to my own specifications.

Friendly Warning !

In past years, provincial correspondents visiting the "M.E." Exhibition, and knowing my address—I make no secret of it ; I've nothing to hide !—have sometimes come wandering around in the hopes of seeing my railway at work, or getting a view of my workshop, despite my oft-repeated statement that I only entertain a few personal friends. Being old, tired, and company-shy, I make a point of keeping well out of the way during the time the Exhibition is on. However, certain folk get the impression that no harm can be done by coming up the alleyway between the houses, and taking a surreptitious squint at my little line, from the passage along the back of the gardens, which is used by the gentlemen who collect garbage, deliver coal (on rare occasions !) and so on. Thereby hangs a funny anecdote. A couple of years or so ago, there was an epidemic of burglary and housebreaking in our locality, and the housewives naturally became jittery. One of them, seeing a suspicious-looking character snooping around, and looking furtively over my garden gate, went indoors and dialled 999. A police patrol car was on the scene in a matter of minutes ; luckily for "Bro. Inquisitive," he just sheered off in time to avoid being carted off to the police-station as a suspected person ! Those who have "been there," may be interested to know that the garden gate has been extended to a height of over 6 ft., and the railings have been shifted so as to enclose the car-wash, making the whole lot private. A nod is as good as a wink to a blind horse !

The "Verdict" Dial Test Indicator

(*Continued from page* 209)

quite small holes. The contact point is adjustable in an arc of 180 deg. about its pivot, so that it can be set either in line with the body or at any angle up to 90 deg. either way. This adjustment is provided either with a friction lock or a special form of ratchet lock.

A further feature of the mechanism is that its action can be reversed so as to respond to pressure on either side of the contact point by means of a reversing lever fitted to the body.

The manufacturers of the *Verdict* indicators have had a very long experience in the production of dial test indicators, having been one of the first firms in this country to manufacture them, and their latest products can be relied upon to enhance still further the reputation earned by their earlier types. Tests of the model "H.E." *Verdict* indicator in the "M.E." workshop have confirmed all the makers' claims for its sensitivity and usefulness for all purposes where instruments of this type are applicable. It is, of course, inevitable that such finely built and well equipped instruments will be more expensive than the more normal type of indicator, but this is more than compensated for by their increased range of usefulness. All enquiries regarding these indicators should be made to the manufacturers at the address given.

The Glasgow S.M.E. Locomotive Test Track

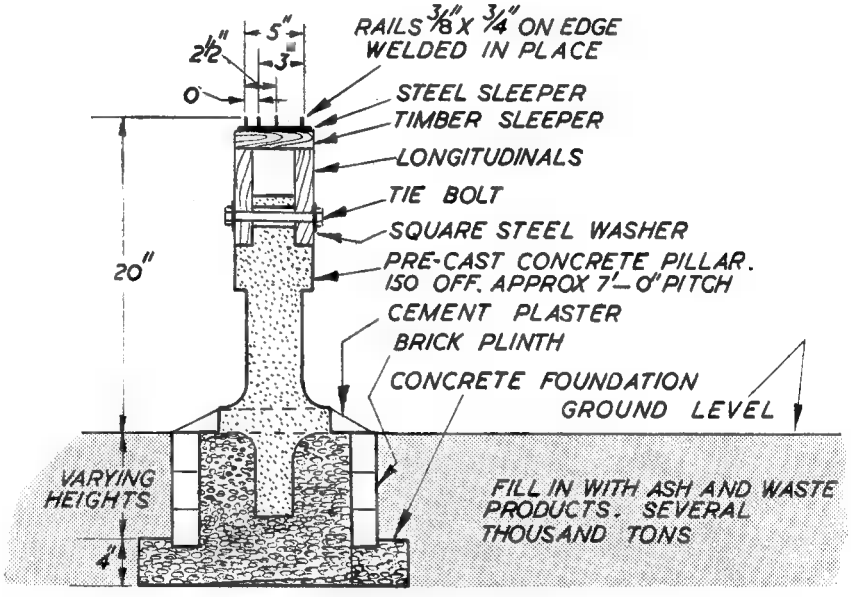
by "Mungo"

WELL, chaps, the locomotive test track is now a reality. Since it was opened for traffic by Mr. J. N. Maskelyne, on May 26th, it has been well tried out.

To the critics who said it would never be completed, we extend a hearty welcome to come along to Rutherglen and see what can be accomplished by a small band of locomotive enthusiasts. Bring along your effort in locomotive construction and you can be sure of a welcome.

Having now risen from that abject position, let me, please, invite all followers of the cult within travelling distance of Glasgow to look us up sometime and have a go on our railroad.

Several lessons were learned on the opening day, and have been noted for further improvement of the track. The first was that where there are a large number of locomotives raising steam, it is a good plan to have several steaming roads

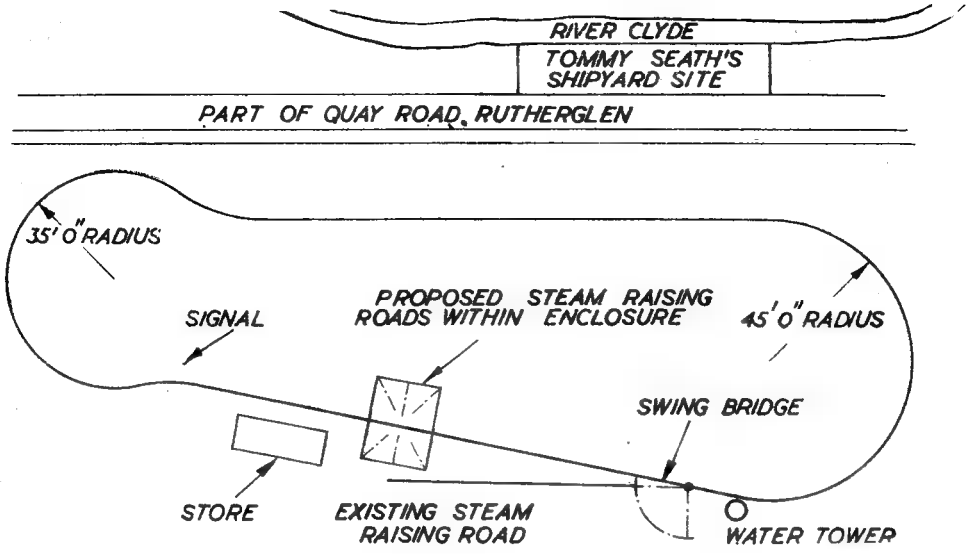


Section through track

Tracks like this are not built without leaders. Dr. Alan Macartney takes pride of place, as he has been in this from start to finish and can be termed our No. 1 contact. McKechnie of the unbounded energy and enthusiasm, besides running a successful business, found time to come along and do more than his share. Bob Lowe travelled 27 miles from and to Helensburgh, often twice a week. Well done, Bob! There was Hannah who rallied the workers when all seemed lost. Jack—also from Helensburgh—was largely responsible for the layout. Begg and Robertson who turned up faithfully Sunday after Sunday, took on all kinds of jobs; no task was too great or menial for them. There are many more too numerous to mention, but to them all, the writer bends low his back in deep salaams. A grand job completed. Truly, "Clyde-built"—your forebears could not have built a better under similar circumstances.

connected to the main track, by a turntable or some similar arrangement. These should be within an enclosure, out of bounds to the public. We had great difficulty in keeping the public away from the "ingins." A separate road should be provided for the engines which have had their turn, and also for the dead ones.

A few words about the track may be of interest to intending builders. The continuous length is 788 ft. It has four gauges, 1¼-in., 2½-in., 3½-in. and 5-in.; it is supported on pre-cast concrete pillars which are embedded in concrete-filled brick plinths. The plinths rest on a 6 in. concrete foundation. Where the topography of the site was not level, these brick plinths were raised to a common height and measure from 1 in. to several feet. Two cored holes were allowed for when casting the pillars. These holes are to take bolts which tie the timber longitudinals. A tongue was left on the top of the pillars;



The layout of the G.S.M.E. locomotive test track

this allowed a step or land for these timbers to rest on. The longitudinals are of various lengths and measure 6 in. deep by 1¼ in. thick. On top of these are nailed timber sleepers 9 in. × 1¾ in. × 1 in. thick and to the sleepers again are screwed steel sleepers 8 in. × 1 in. × ¼ in. thick and both are pitched at 7 in. intervals. The steel sleepers have three 7/32 in. dia. countersunk holes drilled in each. Ten at a time were placed in a jig for drilling. This simplified and speeded up the work, but the disposal of the swarf was a problem. The driller having once had a similar disposal problem with his empties, finally found the solution to this one.

The rails, four in number, are welded to each steel sleeper. We were very fortunate in being allowed to use an electric welding plant free of charge, but the welding was carried out by a contractor.

The track in plan has been referred to as a "hambone" section. From our observations the track should be a good test for the ham parts. The plan, not to scale, gives an idea of the layout and proposed additions. The section through the track shows how the pillars, etc., were finally erected. Reference has been made in THE MODEL ENGINEER to the superiority of all-metal tracks. The method we adopted appears to have much to commend it. The timber longitudinals may deteriorate in due course, but having taken so much time and labour to construct we are not now likely to neglect the preservation. It took us twelve years to build this. It has been well worth waiting for.

Rules and regulations, apart from testing pressure gauges, have not been finally formulated. We are proceeding on the information so kindly supplied by our friends of the Romford Society. We, like Romford, shall not tolerate drivers halting at the fruit trees when in fruit.

Finally, we hope the secretaries or track convenors of the various railroad tracks in this country and beyond our island will submit their results to our Editor, whom, we are sure, will be pleased to publish any items of interest.

The steam locomotive still holds the field as the most compact prime-mover using fuel indigenous to this country.

For the Bookshelf

Your British Railways. (Published by the Railway Executive.) 48 pages, size 10 in. by 13 in. Profusely illustrated. Price 2s.

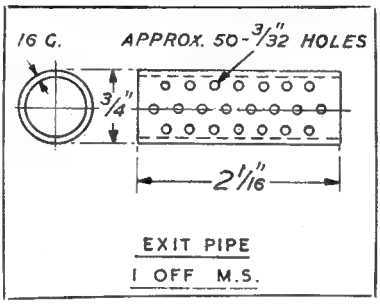
Written in popular language and illustrated by very numerous photo-reproductions, this book introduces its readers to practically every department of British Railways' organisation. We are given glimpses of the manner in which passenger and freight traffic are operated, and see something of the onerous duties of the men and women who are responsible for its care. We think the book should well serve its purpose of acquainting the public with some knowledge of what the railways do for us all and how they do it. Few people in a train, for instance, give a thought to the work of the enginemen, the signalmen, the booking clerks, or the many other grades of railway employees; this book bids fair to do something to alter that state of affairs, and so propogate a better understanding of the matter.

PETROL ENGINE TOPICS

*A 50-c.c. Auxiliary Engine

by Edgar T. Westbury

ONE or two points about the assembly of the engine should be noted, particularly in view of the fact that the general arrangement drawing on page 414 of the March 29th issue shows it assembled with the cylinder vertical, whereas the horizontal arrangement is being specially dealt with here. In the above drawing it will be noted that the inlet port is on the inner side, over the main bearing housing, but this position is clearly impracticable with the horizontal cylinder, and the inlet port is thus changed over to the outside. The transfer port cover is then at the top, and the exhaust port on the underside.



The order of assembly is as follows: First insert the inner main ball-race in the main housing, and press the crankshaft fully home. It is advisable to place the magneto mounting plate temporarily in position, with its ball-race, to guide the end of the shaft and prevent it tilting during this operation. When in place, the shoulder on the crankshaft should come practically flush with the end of the packing bush, so that when the roller is assembled and its securing nut tightened, it will just allow the shaft to turn freely, with no appreciable end play. If this is not so, it can be adjusted by skimming either the shoulder of the shaft or the end of the bush as required. The roller can then be fitted, taking care to see that the key does not foul in the depth of the keyway, but fits closely at the sides. If available, a ⅛ in. shakeproof washer should be fitted between the recessed end face of the roller and the securing nut, the latter being then tightened up hard with ■ tubular box-spanner; during this operation, it is practicable to hold the crank web in the vice, using copper clamps to protect it from marking.

It should be noted that the aperture in the end of the main housing is large enough to enable the roller to be withdrawn without dismantling the entire crankshaft; this is a great convenience in servicing. The magneto mounting plate can now be secured by its four screws, which should be tightened up very firmly with ■ well-fitting screwdriver, and should on no account project above the machined surface. A felt washer, 3/16 in. thick, is now made to fit in the ball-race housing (packing felt as fitted inside "war surplus" instrument cases is suitable) and is thoroughly soaked in melted grease before assembly, after which the ball-race is pressed home, and should lie flush with the face of the housing spigot.

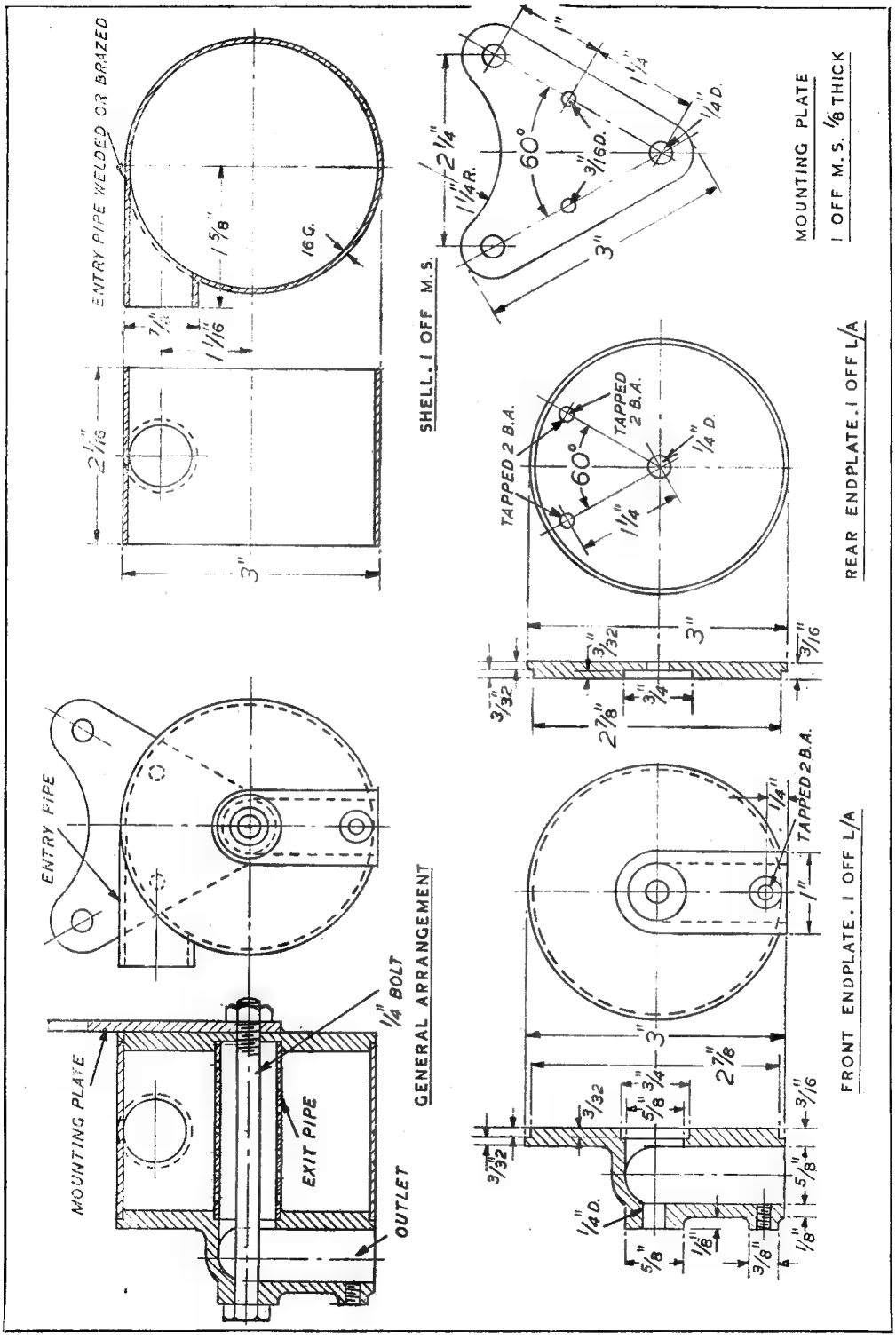
Next, the magneto backplate can be fitted, and held in place by two O B.A. screws and washers, tapped into the magneto mounting plate; these screws may, with advantage, penetrate into the end face of the mounting to obtain ■ greater length of thread than is possible in the mounting plate alone. Although not definitely specified, it is a good policy to fit another thin felt washer at the front of the ball-race to exclude foreign matter which may enter by way of the aperture in the backplate, but this washer should not be heavily charged with grease, or it may find its way on to the contact-breaker points.

The magneto cam and flywheel can now be fitted to the shaft, again taking care to see that the key fits properly and the surfaces are scrupulously clean. Again, the crank web can be held in the vice to enable the nut to be screwed up really tightly, but do not assume that the only limit to the force applied is that of your own physical strength, aided by the longest lever available. "There is reason in all things"—and one qualification of an engineer is to know how tight ■ nut should be set up!

While on this subject, it is advisable to point out that one should never attempt to remove the magneto with ■ hammer; at the best, the thread on the shaft is liable to be burred up, and at the worst, the shaft may be bent or the bearings ruined. There are three tapped holes in the hub of the "Bantamag" flywheel for attaching an extractor, which may be made in the form of a flanged steel socket having a central set-screw, and can be attached by three screws in these holes. It is well worth while, in view of the grief and pain it will save, to make up such an extractor at the very start.

When this group of components is assembled, it should be possible to spin the shaft quite freely; if not, find the reason why, and correct it. The crankcase can now be bolted to the housing, with the connecting-rod assembled on the crankpin. A paper joint can be used between the crankcase and housing, with a little shellac or other joint varnish to assist sealing the joint; ■ similar washer may be used under the cylinder base.

*Continued from page 152, "M.E.," August 2, 1951.


ENTRY PIPE WELDED OR BRAZED
1 5/8"
16 G.
1/16"
1 1/16"
2 1/8"
3"
SHELL. 1 OFF M.S.
2 1/4"
1 1/4 R.
60°
3/16 D.
1 1/4"
1"
1/4 D.
3"
MOUNTING PLATE
1 OFF M.S. 1/8 THICK
TAPPED 2 B.A.
60°
TAPPED 2 B.A.
1/4 D.
1 1/4"
3/32"
3"
3/16"
3/32"
2 7/8"
3/4"
REAR ENDPLATE. 1 OFF L/A
ENTRY PIPE
1/4" BOLT
MOUNTING PLATE
EXIT PIPE
OUTLET
GENERAL ARRANGEMENT
1/4"
1"
TAPPED 2 B.A.
3"
2 7/8"
3/32
5/8"
3/4"
3/16"
3/32"
5/8"
1/4 D.
5/8"
1/8"
3/8"
1/8"
FRONT ENDPLATE. 1 OFF L/A

Before fitting the piston, the cylinder should be tried in place, to make sure that the connecting-rod lies truly in the centre and is not forced over when the piston is fitted. It is better to have a little end play on the crankpin than the other way. The clearance between the two faces of the little-end eye should be equal both sides, and it goes without saying that this should not vary at any point of rotation—but try it to make sure.

The piston, with its rings, can now be fitted—don't forget that the vertical edge of the deflector should be towards the transfer ports—and the gudgeon-pin pressed or gently tapped in till it clears the cylinder wall both sides. In fitting the cylinder-head, no gasket should be necessary, but be sure that the spigot bears evenly all round, and if necessary, the head should be lapped on the spigot to ensure this. A little jointing varnish should be sufficient to ensure a perfect seal; the same applies to the fitting of the decompressor, but a soft copper washer, as used for miniature sparking plugs, may be interposed here if desired. Paper washers are satisfactory for the transfer and inlet flanges, but a Hallite or Klingerite (asbestos compound) gasket is desirable for the exhaust flange.

Silencer

This has been designed specially to suit the horizontal cylinder arrangement, but is also applicable to other positions, with or without slight alteration of pipe fittings. The design is simple, but reasonably efficient, without setting up too much back pressure, and it can be quickly dismantled for cleaning, a rather important consideration in these small engines, which are liable to foul the exhaust system fairly rapidly. This silencer works on the well-known "vortex" principle, the gases entering tangentially in to a cylindrical expansion chamber, setting up a rotary swirl and thereby lowering the pressure at the centre of the casing, where the gases are allowed to escape.

The casing is intended to be made from a piece of seamless steel tubing 3 in. diameter, though it could be made by rolling a sheet of 16- or 18-gauge material and making a riveted, brazed or welded seam joint. Copper tube would be easier to work, but very difficult to obtain at present. A piece of $\frac{7}{8}$ in. diameter tube is brazed or welded to this tube to form the tangential entry pipe, an elliptical aperture being cut in the casing at this point; this tube is intended to telescope over a short length of tube screwed into the exhaust elbow, and may be clamped by splitting the end and fitting a split collar and bolt, but this should not be necessary if the pipe is a good fit. It is, in fact, best to avoid a rigid joint, so as to allow for expansion.

The two endplates are machined with spigots to fit inside the casing tube, the inner one being a plain flat disc, and the outer one being a casting with a cored exit passage leading out at right-angles to the axis. An internal perforated pipe collects the gases from the centre of the casing, and is located by recesses in both endplates, a bolt passing through the centre holding the entire assembly together.

If the task of drilling about 50 small holes in the exit pipe is considered too tedious, they may be replaced by a series of slots cut with a fairly wide slotting saw, so as to produce a total aperture area about the same as that of the holes. The length of the pipe should be such that it has a slight end play in the recesses of the endplates when free, but is held firmly when the bolt is tightened up so as to spring the endplates together slightly.

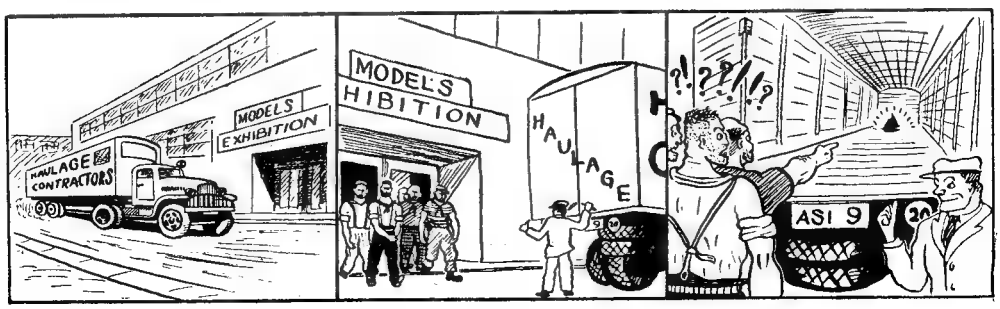
The silencer assembly is suspended underneath the crankcase by a triangular steel plate $\frac{1}{8}$ in. thick, which fits on two of the crankcase studs at the top, while the lower hole takes the central silencer bolt, and two additional holes are provided for 2-B.A. screws tapped into the inner endplate. It will be seen that the outer endplate can be turned in any position, as convenient, and a tail pipe $\frac{5}{8}$ in. diameter of any length, or bent as desired, can be attached by a single set-screw, provided that the pipe is a neat fit in the bore of the passage.

If the engine is used in any other than the horizontal position, the plate may have to be modified or a different method of attachment adopted, but subject to this reservation, it is almost universally adaptable and may be used on almost any type of engine if made of suitable size, proportional to cylinder capacity.

A Correction

I very much regret to inform readers that in spite of the care taken to work out the timing of the Wico "Bantamag" magneto, as described in the July 19th issue, I appear to have slipped up rather badly. I am going very carefully into this matter and will deal with it in a later issue, but meanwhile, if any constructors have already timed the magneto as instructed, it only means the cutting of another keyway to put matters right.

(To be continued)



Model Power Boat News

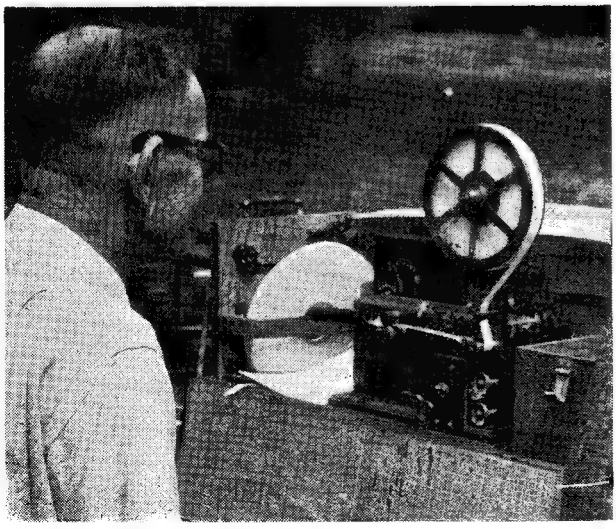
by "Meridian"

Mr. Emery (Bedford) with his radio-controlled diesel-driven cruiser

THE construction and development of a successful flash steam hydroplane has always offered a big challenge to the ingenuity and patience of the model power boat enthusiast. In view of this, it is hardly surprising that flash steamers competing in the various regattas are vastly outnumbered by the i.c.-engined boats.

As an example of the difficulties encountered by exponents of flash steam, it may be mentioned that since the days of the famous *Chatterbox* the number of flash steam boats capable of producing a high performance at practically every attempt, could almost be counted on the fingers of one hand, although quite a few boats have made outstanding runs from time to time—just to encourage their constructors!

Some of the most consistent flash steam boats for many years have been boats of the *Ifit* series, made by A. Cockman, of the Victoria Club, and the development of the earlier boats has been fully described in THE MODEL ENGINEER during the war years.

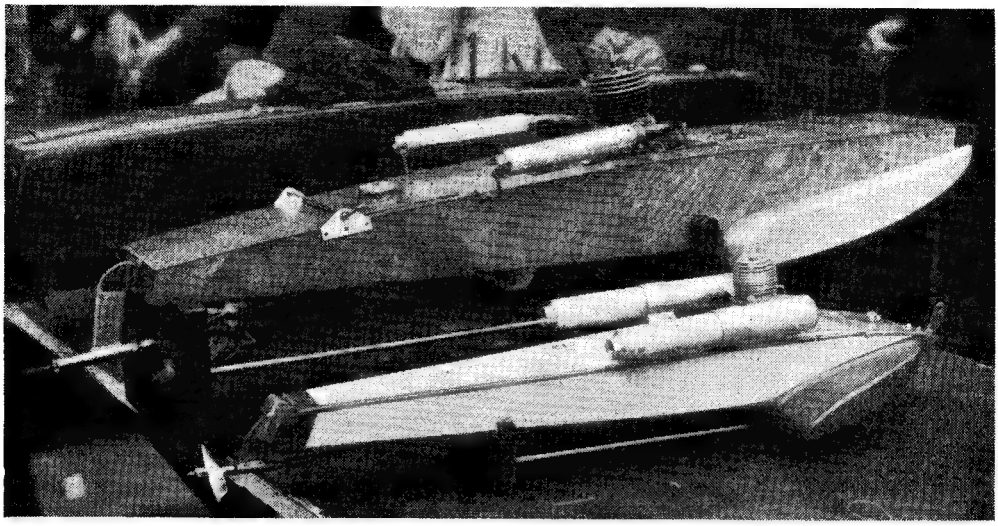


The North London club's electrical strip timing apparatus in action

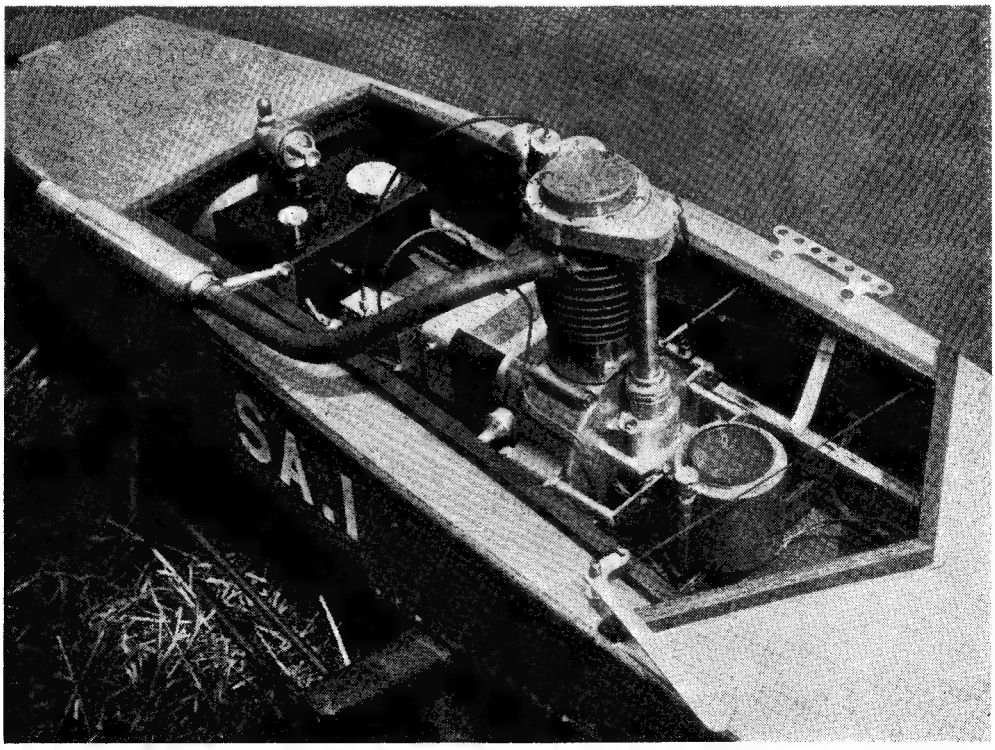
The very latest of the series, *Ifit* 8, is rather a new departure, since it is a Class "C" boat, built to a weight limit of 5 lb. This plant shows many outstanding features, including a single-cylinder engine with a pressure-balanced disc rotary valve, fuel pump to blow-lamp, and a well-thought-out hull design for a surfacing flash steamer. It is hoped to obtain some more detailed information about this boat for later instalments of "Model Power Boat News."

Recent Regattas

The annual regatta of the Wicksteed Model Yacht and Power Boat Club, proved the largest ever held at Wicksteed Park, Kettering, and no less than 140 competitors and friends had tea in the specially reserved section of the Wicksteed Park Pavilion at the end of the regatta. The highlight of this regatta was undoubtedly the remarkable performance of J. Innocent's *Betty*. The Timpson Trophy and the Newman Lowke Cup, both Class "A" events—the latter a 1,000 yds. event—were won by this veteran speed boat. *Betty* was first launched in 1934, and in the Timpson Trophy race she recorded her best ever speed—57.14 m.p.h.! In the 1,000 yd.



(Foreground) Mr. C. Stanworth's "Meteor IV" with "Ensign" 10 c.c. engine, and (centre) Mr. W. Morris's "Rangi II" with "Atom V" 30-c.c. engine



Mr. N. Boero's Aspin-valved 30-c.c. engine in his "A" class boat

race 53.4 m.p.h. was the average speed, which made a new "A" Class record for this distance.

The Paten Cup for 15-c.c. hydroplanes went to the holder, G. Lines (Orpington), with *Sparky II*, at 58.1 m.p.h., and the Douglas Cup for 10-c.c. boats went to L. Pinder, with a new Dooling-engined craft, at 62.6 m.p.h. Some of the runners-up put up fine runs, too; K. Williams' *Faro* did 56.1 m.p.h. in the 500 yd. Class "A" event, but unfortunately failed to finish in the 1,000 yd. race, another Bournville boat, by W. Morris, *Rangi II*, taking second place.

In former years the Wicksteed regatta was for speed craft only, but recently the Whitworth Cup for steering boats has proved a popular event, this time the holder, K. Brownridge (Bedford), retained the trophy after a re-run with Mr. Green's *Lelonga*. The clubs represented at the regatta included Bournville, Derby, Coventry, Runcorn, Victoria, Blackheath, Enfield, Oprington and S. London.

Results:

500 *yd. Race for the Timpson Trophy* (30 *c.c. Boats*)
(1) J. Innocent (Victoria), *Betty*, 57.14 m.p.h.
(2) K. Williams (Bournville), *Faro*, 56.19 m.p.h.
(3) A. Cockman (Victoria) *Ifit 7*, 31.47 m.p.h.

500 *yd. Race for the Paten Cup* (15 *c.c. Boats*)
(1) G. Lines (Orpington), *Sparky II*, 58.1 m.p.h.
(2) R. Mitchell (Runcorn), *Beta 2*, 42.9 m.p.h.
(3) T. Dalziel (Bournville), *Naiad 2*, 41.47 m.p.h.

300 *yd. Race for Douglas Cup* (10 *c.c. Boats*)
(1) L. Pinder (S. London), *S22*, 62.6 m.p.h.
(2) L. Pinder (Kingsmere), *Rednip*, 54.3 m.p.h.
(3) M. Brearly (Derby), *D12*, 46.8 m.p.h.

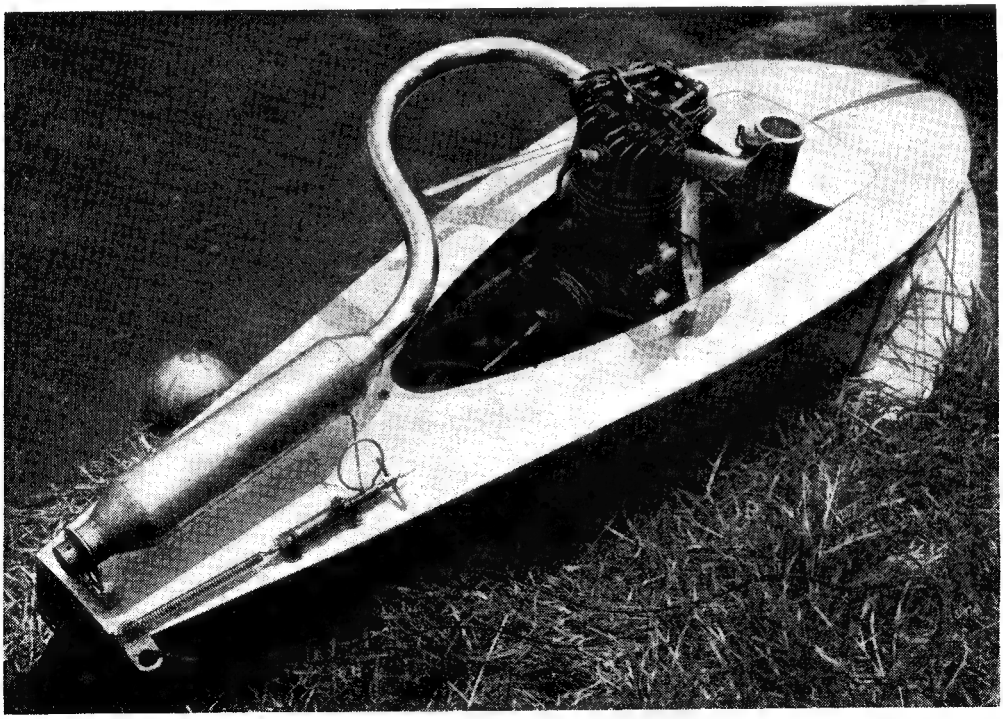
Steering Competition for Whitworth Cup
(1) K. Brownridge (Bedford), *Wye*, 6 + 3 pts.
(2) M. Green (Bedford), *Lelonga*, 6 + 1 pts.
(3) J. Benson (Blackheath), *Comet*, 5 pts.

1,000 *yd. Race for the Newman Lowke Cup*
(1) J. Innocent (Victoria), *Betty*, 53.4 m.p.h.
(2) W. Morris (Bournville) *Rangi II*, 24.23 m.p.h.

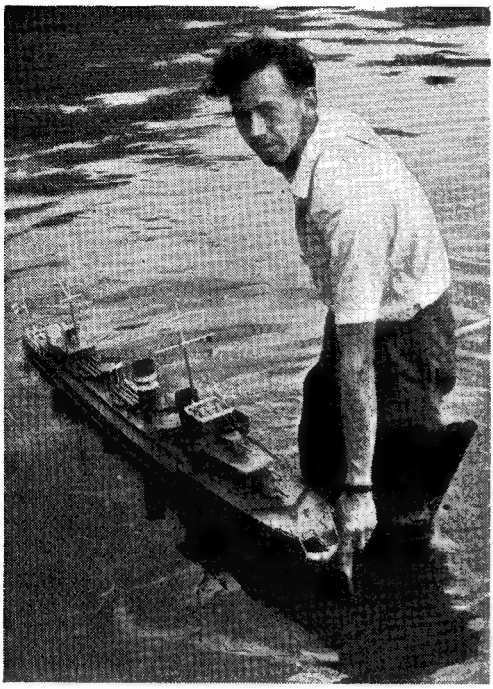
St. Albans and N. London Regatta

This regatta was held on the lake at Verulamium, St. Albans, and was a joint effort of the N. London and St. Albans societies. It was the first time a regatta has been held at this very attractive venue, and if repeated, is likely to prove a most popular event for powerboat men and their friends to look forward to each year.

A very full programme included both Nomination and Steering events for the free-running boats, and speed events for all classes of hydroplanes.



Mr. S. H. Clifford's "Blue Streak," which exceeded a mile per minute at St. Albans



Mr. Lambert (West London) with his destroyer, after a head-on crash at St. Albans

The speed events proved in all cases to be very closely contested, and some of the best speeds of the season were recorded. J. Innocent's *Betty* improved her speed of the previous regatta to 58.7 m.p.h. but this time was beaten by another four-stroke engined boat, S. Clifford's *Blue Streak*, which made a run at 60.1 m.p.h., the best speed of this boat to date. K. Williams, with *Faro*, was also on form, with a run at 58.1 m.p.h. This was one of the fastest Class "A" races ever seen, and gave the large crowd plenty of thrills.

The Class "C" event, too, was won at over the 60 m.p.h. mark by R. Phillips' *Foz II*, the record holder in this class, and the "C" Restricted Race went to G. Stone, with his boat, *Bill Barnes*, at 54.8 m.p.h.

Among the steering craft present were some outstanding prototype boats, in particular Mr. Porter's *Slickery* (Victora) and Mr. Lambert's destroyer (W. London) were most pleasing to watch. A coal-fired tug by a member of the home club caused much interest.

Results :

80 *yd. Nomination Race*
(1) A. Rayman (Blackheath), *Yvette*, 1.67 per cent. error.
(2) Mr. Drayson (N. London), *Nippy*, 3.7 per cent. error.
(3) Mr. Emery (Bedford), *BO13*, 8.3 per cent. error.

500 *yd, Class "A" Race*
(1) S. Clifford (Victoria), *Blue Streak*, 60.16 m.p.h.
(2) J. Innocent (Victoria), *Betty*, 58.7 m.p.h.
(3) K. Williams (Bournville), *Faro*, 58.1 m.p.h.

500 *yd. Class "B" Race*
(1) G. Lines (Orpington), *Sparky II*, 37.88 m.p.h.

Steering Competition
(Possible points 9)
(1) J. Benson (Blackheath), *Comet*, 5 pts.
(2) E. Vanner (Victoria), *Leda III*, 4 pts.

300 *yd. Class "C" Race*
(1) R. Phillips (S. London), *Foz 2*, 61.38 m.p.h.
(2) W. Everitt (Enfield), 56.8 m.p.h.

300 *yd. "C" Restricted Race*
(1) G. Stone (Kingsmere), *Bill Barnes*, 54.8 m.p.h.
(2) G. Stone (Kingsmere), *Lady Babs II*, 29.2 m.p.h.

300 *yd. Class "D" Race*
(1) E. Woodley (Enfield), 41.47 m.p.h.
(2) W. Everett (Enfield), *Jaffa*, 39.85 m.p.h.

The Model Power Boat Association

At a committee meeting held recently the following matters were considered :—

Record Claims. The following claims were ratified :—

Class "A," 500 yds.—E. Clark (Victoria), boat *Gordon II*, speed 63.7 m.p.h.

1,000 *yds.*—J. B. Innocent (Victoria), boat, *Betty*, speed 53.4 m.p.h.

Class "C," 500 yds.—R. Phillips (S. London), boat, *Foz II*, speed 66.4 m.p.h.

"M.E." Exhibition. There will be a large tank for the demonstration of model power boats. Straight running, prototype and Class "D" boats will be suitable and London clubs are asked to give their fullest support. Exhibits are also required for the M.P.B.A. stand.

Grand Regatta. The following events will be held on Sunday, September 2nd, at Victoria Park, Hackney.

For free-running boats, 75 yd. nomination race and steering competition.

Speed events over 500 yds. for Class "A," "B," "C" and "C" (restricted) hydroplanes.

For this regatta all entries must be made in advance. Entries will be accepted by post, telephone or may be handed in at the M.P.B.A. stand at the "M.E." Exhibition but *no entries will be accepted on the day.*

Competitors entering free-running boats, please state time for nomination race and the name of the boat, and M.P.B.A. number should be stated in all cases. In addition, only one boat per event may be entered by each competitor.

In the speed events a special time limit will apply.

Hon. Secretary : J. H. BENSON, 25, St. Johns Road, Sidcup, Kent. Telephone : Foots Cray 7428.

Novices' Corner

A Holder for the Dial Test Indicator

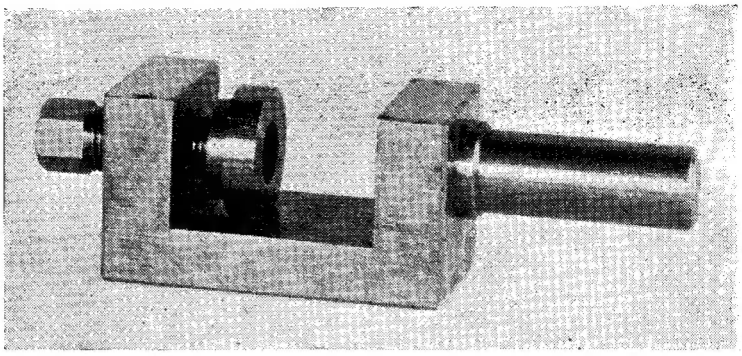


Fig. 1. The finished holder

THE test indicator is so often used in the workshop, for setting up work in the lathe or shaping machine, that a simple form of mounting for the indicator may save much time and trouble.

One of the commonest uses of the test indicator is for setting a shaft to run truly in the four-jaw chuck or, again, it may be necessary to set the fixed jaw of the shaping-machine vice exactly parallel with the line of travel of the ram. In either case, time may be saved if the indicator can be quickly attached to a lathe or shaping-machine tool already mounted in the toolpost, for the machine slides are then available to bring the indicator into contact with the work. The small holder, here described, has for a long time been employed to mount a Starrett dial test indicator on both lathe and shaping-machine tools, and this simple device has certainly proved most useful and time-saving.

The holder itself is illustrated in Fig. 1, and in Fig. 2 is shown fixed to one of the tools in the lathe turret and with the indicator attached. As will be seen, the holder consists of a body portion (*A*), carrying a short spindle (*B*) for the attachment of the indicator clamp, and at the other end a clamp-screw (*C*) with a swivelling-head is fitted.

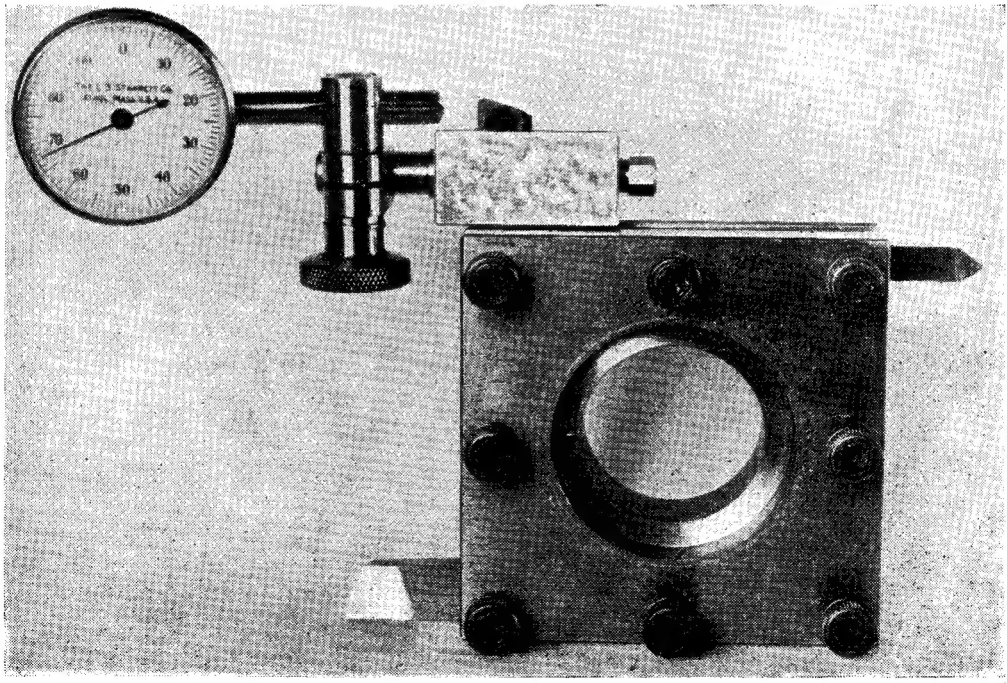


Fig. 2. The holder attached to a tool in the lathe turret

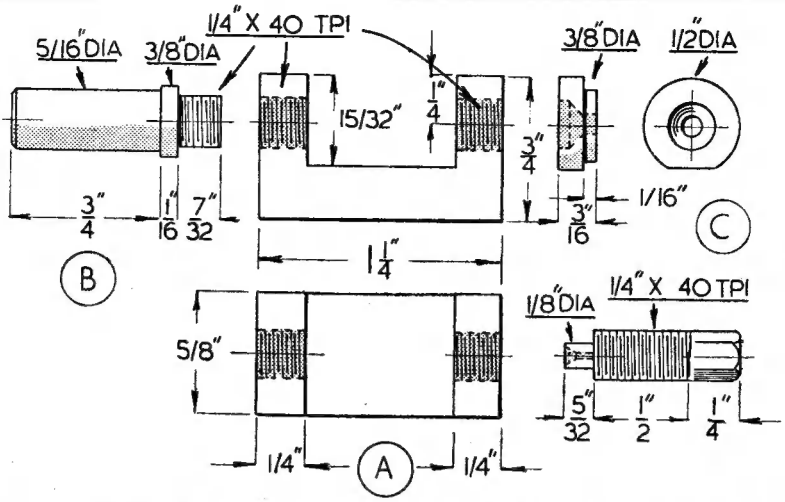


Fig. 3. "A"—the body; "B"—the spindle; "C"—the clamp-screw and swivelling-head

To use the appliance, the body is placed on the projecting end of the lathe tool and the clamp-screw is tightened; the test indicator clamp is then pushed on to the spindle and lightly secured in place. After the indicator has been set at the correct height, its clamp-screw is fully tightened and the contact point is brought against the work by turning the saddle feed screws. This gives a very rigid mounting and, at the same time, allows the dial to be easily read.

Construction

The body is made from a short length of $\frac{3}{4}$ in. square mild-steel; this is first marked-out to the dimensions given, and the surplus metal is next cut away with the hacksaw.

After the gap has been filed to the finished size, one end of the work is marked-out for the position of the clamp-screw, and the body is next gripped vertically in the drilling machine vice, so that a tapping-size hole can be drilled axially from end to end.

The thread specified for both the clamp-screw and the spindle is $\frac{1}{4}$ in. $\times$ 40 t.p.i., and for this the tapping-size drill is No. 2; but if a coarser thread is used, a smaller drill will, of course, have to be used to give a thread of the correct depth.

The tap is either put right through the work, or the two ends of the body can be tapped separately. The $\frac{5}{16}$ in. dia. spindle is turned from a length of $\frac{3}{8}$ in. dia. rod to a smooth sliding fit in the indicator clamp, and if the small shoulder illustrated is left on the work, the appearance of the part will be improved. The spindle is next parted off to length and then reversed in the chuck for reducing the diameter of the end to $\frac{1}{4}$ in., so that the threading can be carried out with the tailstock die holder. The clamp-screw is either made from 4 B.A. hexagon rod or, if round rod is used, a cross-hole is drilled to take a tommy bar for tightening the screw.

After the shank of the screw has been turned and threaded, the diameter of the tip is reduced to $\frac{1}{8}$ in. or so, and a centre drill is fed in to form a countersink almost up to the full diameter of the screw's end. The swivelling-head for the clamp-screw is turned from a length of $\frac{1}{2}$ in. dia. steel rod and, after being drilled to fit the tip of the screw, the head is deeply countersunk with a centre drill. As will be seen, a flat is filed on the underside of the head in order to prevent rotation as the clamp-screw is turned; but careful hand-fitting is required to ensure that the head can slide freely and without shake along the gap. When the head has been correctly fitted, the parts are assembled in the body and a conical punch is passed through the spindle hole and then lightly struck with a hammer; this will expand the countersink formed in the end of the clamp-screw so that the head will be retained in place, but the clamp-screw will remain free to turn.

Finally, the spindle is screwed firmly in place and the holder is then ready for use.

Catalogue Received

We have just received from Messrs. A. J. Reeves & Co., 416, Moseley Road, Birmingham, 12, their 1951-2 catalogue, and we are impressed by the excellent selection of wares of all descriptions, from raw materials to machine tools, that are offered to the model engineering public.

Every reader should avail himself of the opportunity of acquiring one of these most useful catalogues, especially the locomotive enthusiasts, who are particularly well catered for.

PRACTICAL LETTERS

A Model Organ Console

DEAR SIR,—On reading my above article in THE MODEL ENGINEER dated July 12th, 1951, I find that an error occurs in line 28 on page 38 where " $\frac{3}{8}$ in. wide " should read " $\frac{1}{8}$ in. wide."

The measurement of $\frac{3}{8}$ in. tends to be rather misleading. A stop-key of $\frac{1}{8}$ in. × $\frac{3}{8}$ in. is almost square, whereas a stop-key $\frac{1}{2}$ in. × $\frac{1}{8}$ in. is very rectangular and when rounded at one end is of correct shape.

Yours faithfully,

Lewisham, S.13. M. G. BREWER.

Conversion of Dynamotors

DEAR SIR,—Mr. Sweet's article in THE MODEL ENGINEER of July 5th, on this subject appears to me somewhat confusing. Either I have misread it, or some errors have crept in, and I think the terminology a little obscure, to say the least.

Presumably the author is dealing with machines having on the armature a motor winding for the usual 24 volt d.c. input supply, and a generator or output winding giving a voltage of anything from 300 to 1,000 volts, according to type, and that these windings are what he refers to as L.T. and H.T. windings respectively. Presumably, also, " M " in the figures denotes the motor (low voltage) winding, and " G " the generator (high voltage) winding, of the machine as originally designed to function.

If so, his statement that " when the armature is stationary its L.T. winding short-circuits the fields " does not agree with the diagrams, in which the " G " winding is the one shown as in parallel with the field winding, and in which the relay contacts break the circuit through this " G " winding. Further, the relay is shown as being energised by the " G " armature winding, whereas the text says that the relay should be of a suitable voltage for the L.T. winding.

It may be that " M " and " G " have got interchanged or the figures, but I think it might be desirable, in the interests of readers, who are, like myself, intending to convert one of these machines to a motor, to ask Mr. Sweet to check up his terminology, and diagrams, and confirm—or otherwise—that he uses the abbreviations L.T., H.T., M, and G as presumed in my second paragraph above.

Further confusion might arise in the case of those types of machine having two or more generator outputs, viz., a low voltage output, often referred to as " L.T.," as well as one or more high voltage outputs.

Yours faithfully,

Sunbury-on-Thames. A. C. HIGGS.

DEAR SIR,—I should like to answer the points made by Mr. Higgs.

In the first place, I did not intend the article to be a description of the alterations necessary to convert dynamotors into high voltage motors, this has been covered adequately in THE MODEL ENGINEER in the past, but only a description of a circuit which overcomes some of the faults usually found in converted motors.

Considered in this light I think the description will be found lucid enough for its purpose.

I used the terms M and G to refer to the functions of the armature windings under the new conditions. I consider that a dynamotor has a number of windings each potentially a motor or a generator ; that is why I referred to the windings in the machine only as H.T. and L.T.

The choice of the windings to act as the motor and the generator must be governed by individual operating conditions, normally, however, the higher voltage winding becomes the motor and the winding originally connected to the fields is connected in the circuit as the generator.

I should be pleased to advise Mr. Higgs in the conversion of his dynamotor if he will communicate with me.

Yours faithfully,

Acton, W.3. E. SWEET.

Midland Railway History

DEAR SIR,—I notice in your " Smoke Rings " section, page 34 of THE MODEL ENGINEER, July 12th—under the paragraph heading " Midland Railway Relics wanted," a statement that, " On August 16th, 1832, a group of local coal-owners met there (The Sun Inn) to discuss and approve a plan for constructing a railway between Mansfield and Pinxton."

This statement, I regret to inform you, is not historically accurate. A railway had already been constructed from Mansfield to Pinxton, having been authorised on June 16th, 1817, and was opened April 13th, 1819 ; there being a description of the opening festivities in the *Nottingham Journal* for April 17th, 1819. All meetings in connection with this line took place in the Swan Inn, Mansfield.

For a complete account of the Mansfield and Pinxton Railway I would refer you to the *Railway Magazine*, July and August issue, 1949, where you will find an article on the history of the line written by Mr. Peter Coxon, of Mansfield and myself.

The meeting held at the Sun Inn on August 16th, 1832, was called because of the refusal of the canal owners to lower their coal rates so that coal from Nottinghamshire and South Derbyshire could compete with that brought to Leicester over the Leicester and Swanington line which had been opened on July 17th, 1832. The resolution accepted by the meeting in the Sun Inn on August 16th, 1832, was, " That there remains no other plan for their adoption than to attempt to lay a railway from these collieries to the town of Leicester."

The collieries referred to were situated at Pinxton on the Upper Erewash and my quotation is from page 8 of F. S. Williams's " The Midland Railways its Rise and Progress." The first mention of a continuation of the Mansfield and Pinxton line with the proposed connection to

Leicester is to be found at a meeting held at Alfreton on August 27th when the public were invited to co-operate for a continuation of the Mansfield and Pinxton line from Pinxton to Leicester. This decision being formally adopted at the meeting held on October 4th, as you correctly state ; at no time in this period, however, did the coal masters concern themselves with the construction of a railway from Mansfield to Pinxton, as this had already been accomplished. It was not until 1847 that the Mansfield and Pinxton line was relaid from cast-iron rails on stone blocks to standard contemporary construction. For a complete account of the early railway history in this district, I would refer you to F. S. Williams's " History of the Midland Railway " and " An Account of Railway Development in the Nottinghamshire Coalfield," J. A. Birks and P. Coxon.

I know of some old Mansfield and Pinxton rails, the property of Mr. Fred Smith of Pinxton, a local model engineer of some repute. I do not know if he would be prepared to let the Brewery Co. have one, but he might be prepared to model one for them.

I trust this information will be of interest to you and I should like to thank you for the pleasure and interest that THE MODEL ENGINEER gives me week by week.

Yours faithfully,

Mansfield. J. A. BIRKS, B.A.

Soldering Monel Metal

DEAR SIR,—I recently gave a friend a piece of what I took to be brass and from which he machined the hubs and hub-caps for a traction engine which he is building. However, on attempting to solder the hubs to the spokes it was found that the material in question was Monel metal. Any of your readers who have tried to solder this metal with the usual fluxes will appreciate the difficulty. The problem was solved by suspending the hubs for about 15 minutes in a saturated solution of copper sulphate (commonly called blue-stone). This produced a substantial layer of fine copper on the Monel metal, which was very easily soldered, and tests showed the copper to be strongly bonded to the Monel metal. I have since used this method on other occasions to solder Monel metal, depositing the copper in the required places only, by coating all other parts with paraffin wax before immersion in the copper sulphate solution. I have applied this technique to other metals but so far aluminium and aluminium alloys have proved obstinate. By using an electrolytic bath—weak solution of sulphuric acid, anode-copper, cathode—the aluminium object on a 2 to 4 volt supply—it has been possible to deposit copper on the aluminium. This coating can be tinned and a soldered joint made to another metal part. However, under very small stress the solder parts company with the aluminium, taking the copper coating with it. I should be interested to know if any of your readers have experimented along these lines, as a simple method of soldering aluminium alloys may be found.

Yours faithfully,

Belfast. J. B. MILLAR.

Some Horses !

DEAR SIR,—In " Smoke Rings " of April 26th " M.E." just to hand, is an interesting item " Even Homer will Nod Sometimes," and this brings to mind a recent incident of mine. Tauranga and district is a primary production area, it's either cows or sheep farming or citrus fruits, consequently our local library has a big section of books on these subjects. I am a dairy farmer, and one day went to the library to get a book on farm animals. Looking along a shelf, I was taken aback ; the " silence " of the library was broken as I laughed aloud ; a brand new book, the title of which was the cause of my laughing, you could not guess. I took the book home and enjoyed its contents, but the author would not be flattered to know his book was classed as farm animals, it was—" British Steam Horses " by George Dow !

Yours faithfully,

Tauranga, N.Z. JOHN H. DANIELS.

CLUB ANNOUNCEMENTS

Birmingham Society of Model Engineers

Meetings will be held at The Crown Hotel, Corporation Street, on August 22nd, September 5th and 19th. Meetings at the White Horse will resume on October 3rd.

The above alteration is due to decorating now taking place at the White Horse.

Also, at the last committee meeting, it was decided to cancel the Public Day, scheduled for September 1st.

Hon. Secretary : R. PHILLIPS, 92, Gilbertstone Avenue, South Yardley, Birmingham, 26.

Winchester and District Society of Model and Experimental Engineers

The society has been rather slow in getting " under steam," but with about 15 staunch supporters over the past 18 months we have now acquired very spacious new quarters, thanks to the members of the Winchester City Corporation and their officials, particularly the Town Clerk, Mr. R. H. McCall.

These new quarters give us ample space for a workshop, meeting and committee room, together with a larger room for cinema shows, exhibitions, etc., and all this for a very nominal yearly rental. The but is situated in ideal surroundings, too, being in the centre of the Old Stanmore Estate, the houses of which were built about 1920. Outside the hut we have ample space to place a portable multi-gauge track, either circular or straight on asphalt or grass. The hut has also all services—electricity, gas, water, together with sanitary accommodation.

We were also very fortunate in having been given use of a room at the " Red Triangle " club, whenever we have required it over the past 18 months. Had it not been for this privilege, the society would probably not have survived. We have received nothing but encouragement from its secretary, Mr. Barnes, who invited us to stage a small exhibition in conjunction with their own, and through this we impressed the members of the City Corporation.

Now that we have progressed so far, we do hope we shall be having plenty of applications for membership.

Hon. Secretary : C. H. BUSHBY, 7, Fox Lane, Stanmore Winchester, Hants.

Cambridge and District Model Engineering Society

The above society will be holding their third model exhibition in the Corn Exchange, Cambridge, from Monday October 29th to Friday, November 2nd, 1951.

Hon. Secretary : J. W. ATKIN, 16, Ross Street, Cambridge.